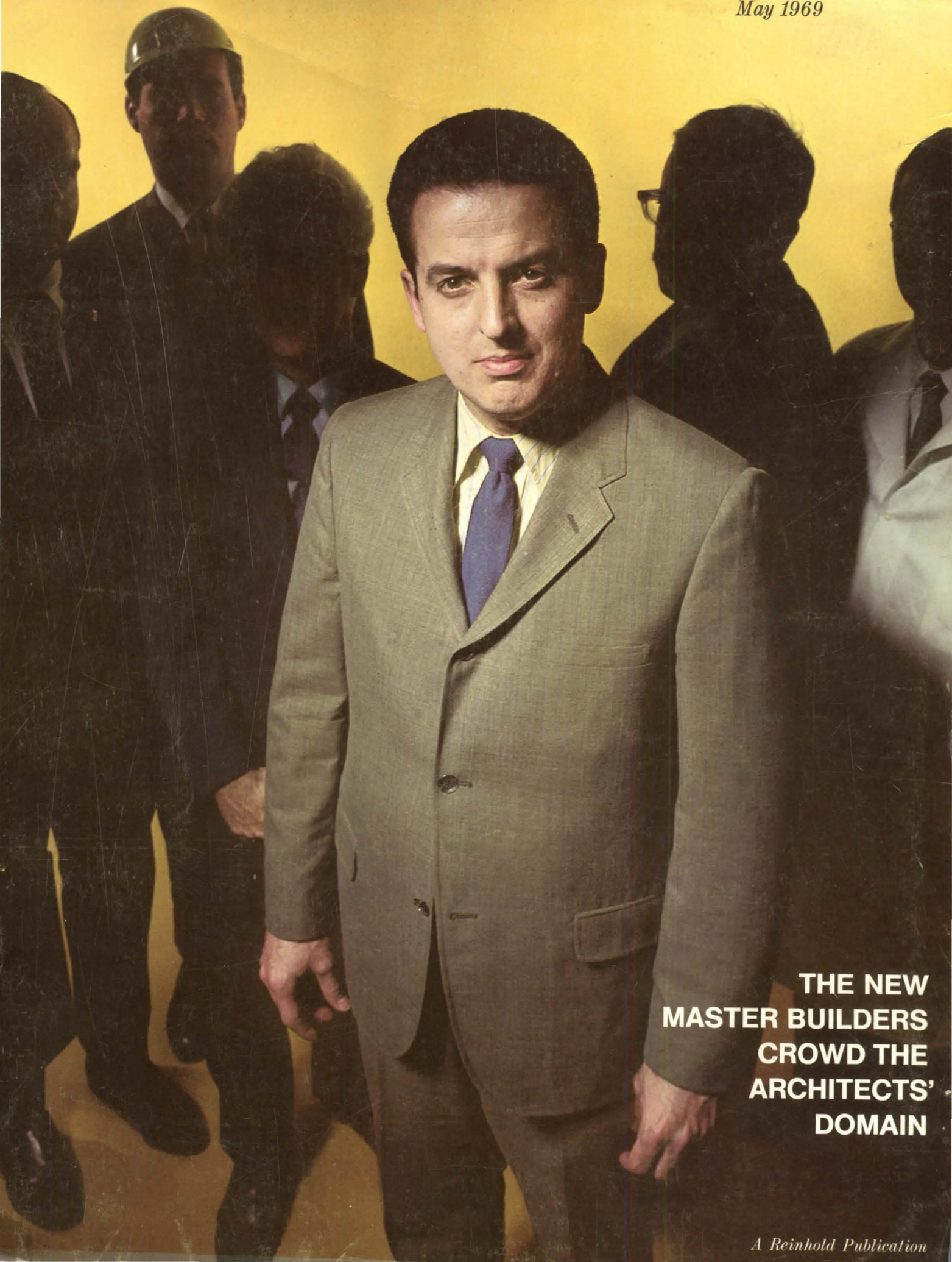
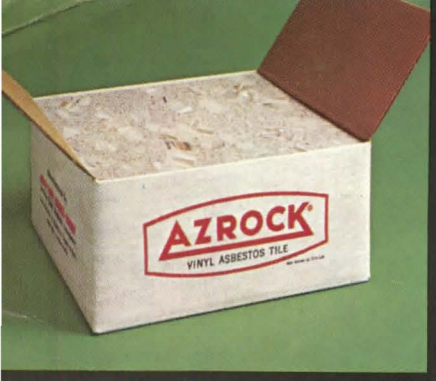
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May 1969

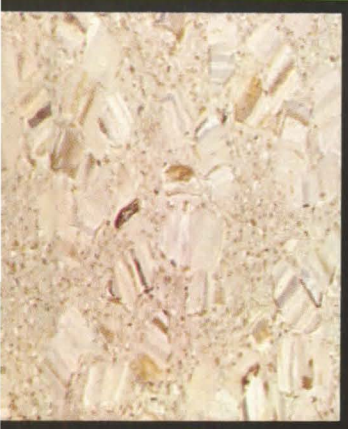


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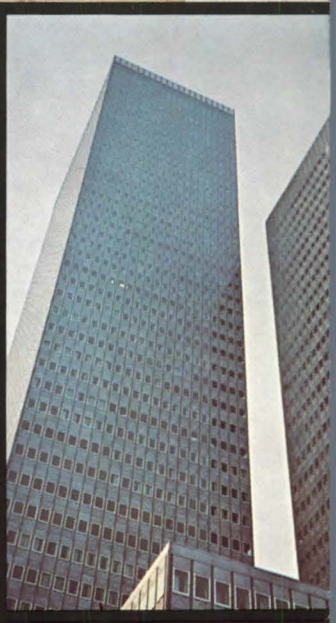






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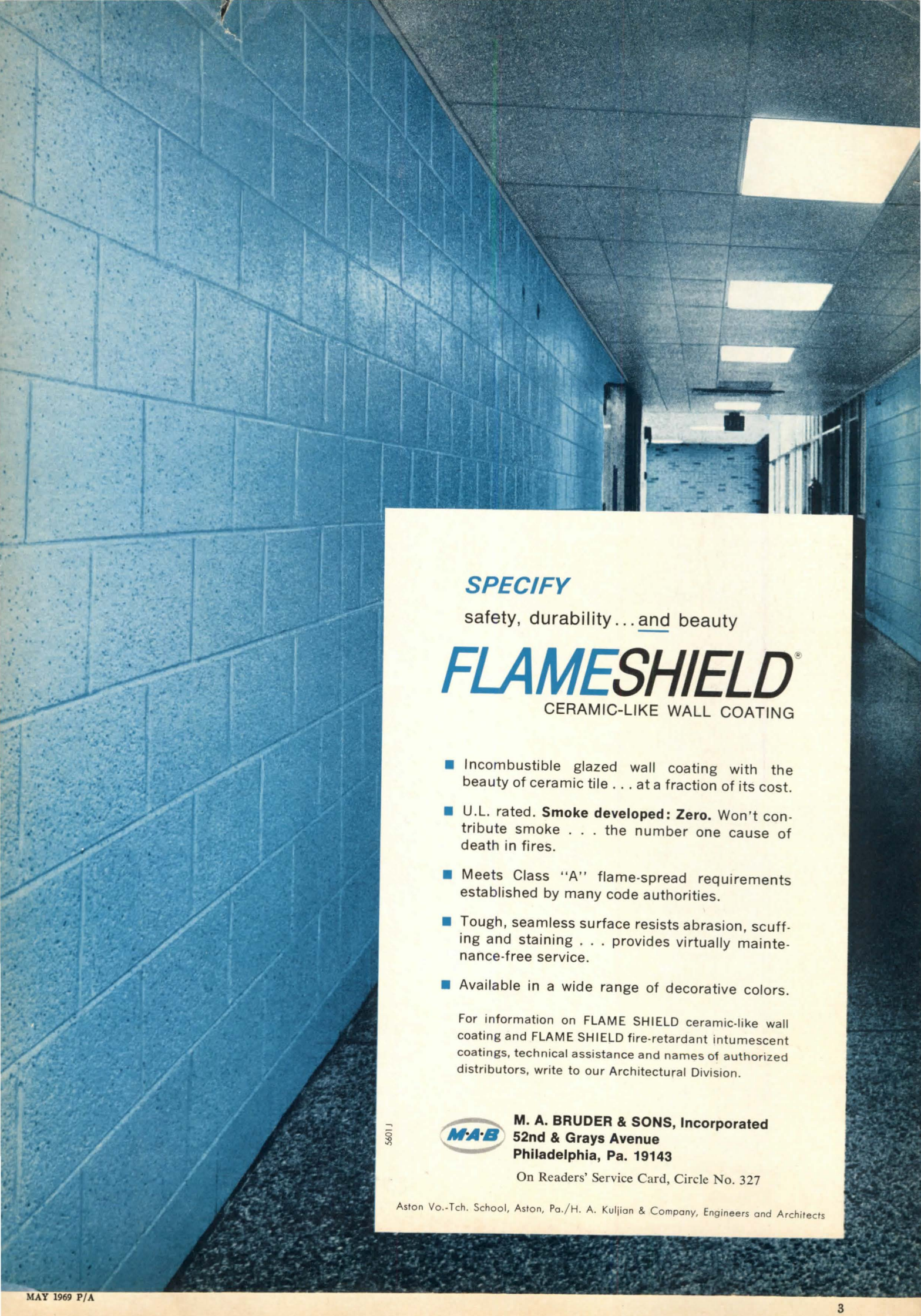


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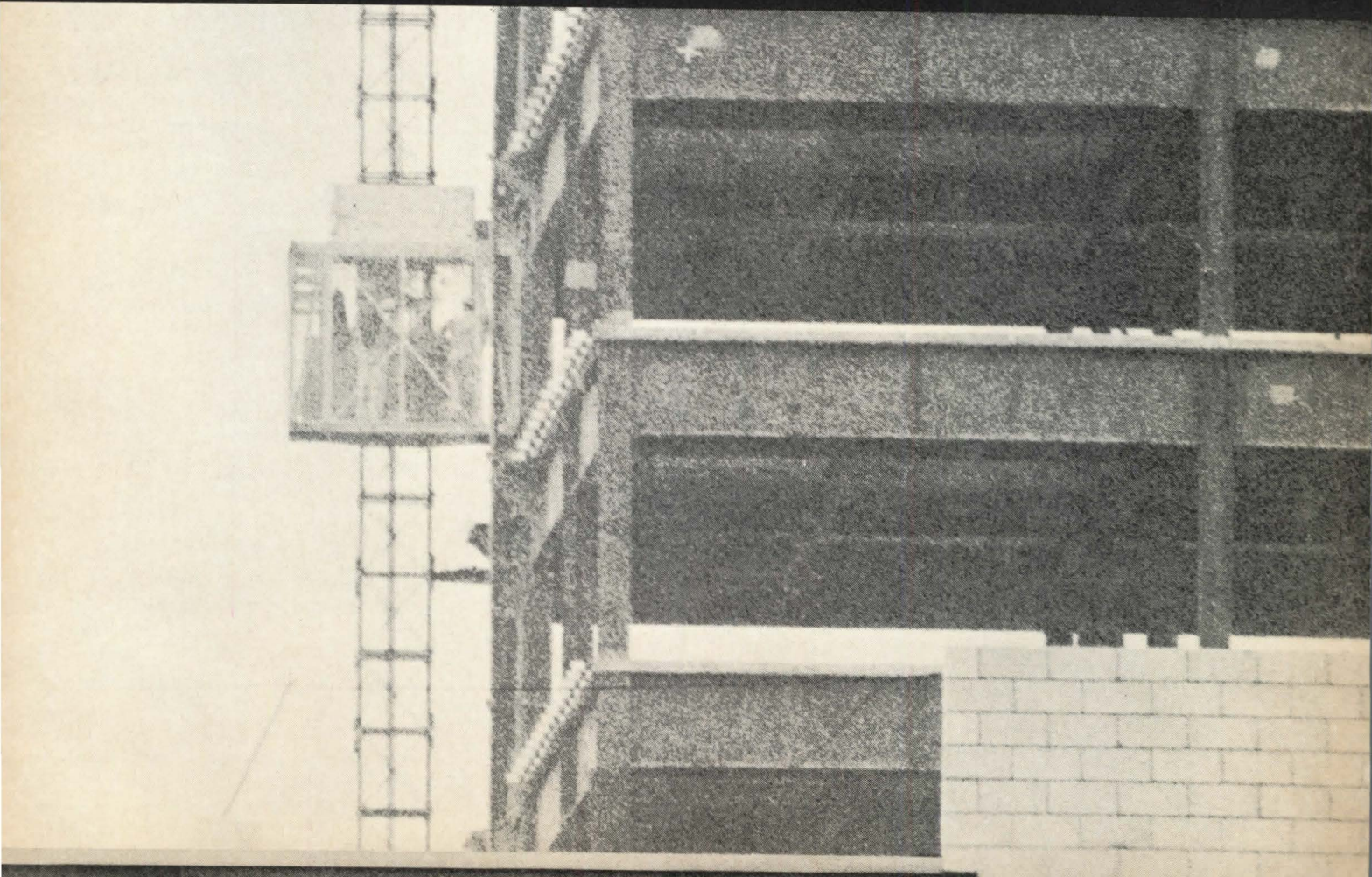
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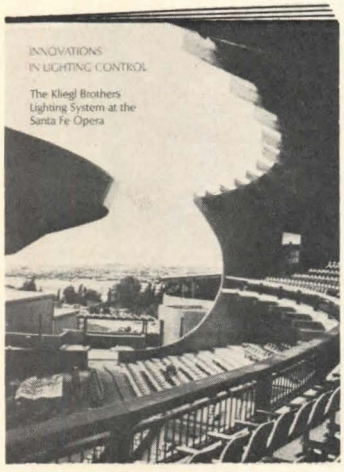
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YOUR POINT OF VIEW

Elaborations on Orthodox Modularism

Dear Editor: I just read the MARCH 1969 P/A, which is devoted mainly to the ineffable Walter Netsch and his "Field Theory." How pretentious to take what is basically an elaboration on orthodox modularism and crown it with that dignified title.

The fine observatory building in the issue, with its envelope of trusswork, was supposedly an early example of the intuitive application of the theory. But I always thought it owed its excellence to the fact that Myron Goldsmith is a masterful engineer and Netsch is a passable architect. It is far more three-dimensional than any of the other Netsch buildings shown. The only thing in the issue that savored of revolution (rather than pseudo-revolution) was the little item about Venturi's Las Vegas show at Yale — or maybe Chip Lord's letter.

PAUL FISHER
San Francisco, Calif.

A Basic Reference for Health Care Facilities

Dear Editor: I should like to congratulate you on the splendid presentation on the spectrum of problems confronting the health care industry today (FEBRUARY 1969 P/A). Being a professional engineer and a hospital administrator, I was particularly impressed by the skillful way in which you handled the technical and administrative complexities.

I enormously appreciated the section devoted to our work here at Temple in creating a modern Health Sciences Center. A superlative job was done in reporting our efforts by the members of your staff who visited and worked with us.

Let me conclude by saying again that you did a tremendous job in presenting the whole gamut of problems in health care today and in presenting the various solutions, both accomplished and tentative, in a manner that will make this issue of your magazine a basic reference for all of us concerned in this field today.

VINCENT L. RICHARDS
Temple University Health Sciences Center
Philadelphia, Pa.

An Outstanding Statement

Dear Editor: I was pleased that an architectural magazine involved itself with every facet of health care (FEBRUARY 1969 P/A) from the technological aspects to the educational field of medicine, and produced such an outstanding analytical statement. The issue makes a thorough and compelling statement in an attempt to produce for the first time, to my knowledge, a means of communication between two professions, which have in the past done very little to explore this area of interrelationship. The most impressive aspect of this issue was that it appealed to, and was understood by, both my architectural colleagues and also my acquaintances in the medical field.

SOPHIE C. KOCH-WESER
Max O. Urbahn Associates
New York, N.Y.

Senatorial Praise

Dear Editor: You and your staff are to be congratulated on a fine review of the Health Care Facilities (FEBRUARY 1969 P/A). The articles show insight and perspective gained, I am sure, by considerable hard work.

I am particularly pleased that you were also impressed by the advantages of the comprehensive approach to delivery of medical care. My staff and I have been studying the delivery of health care for the past two years and are convinced that this approach should be encouraged. We are presently drafting a bill to amend the Hill-Burton Law to make money available for construction of comprehensive health facilities. I have taken the liberty of enclosing a draft of the bill and would greatly appreciate any comments you and your staff may have. Again, congratulations on a job well done.

CHARLES H. PERCY
United States Senator
State of Illinois

Impressive Coverage

Dear Editor: Your February Health Care issue is impressive coverage of the growing revolution in health care delivery patterns, and you rate kudos for devoting so much energy and space to treatment of the issues, rather than photographs of specific solutions.

Architects who understand both the issues and their own potential for teaching health care professionals how to es-

Continued on page 10

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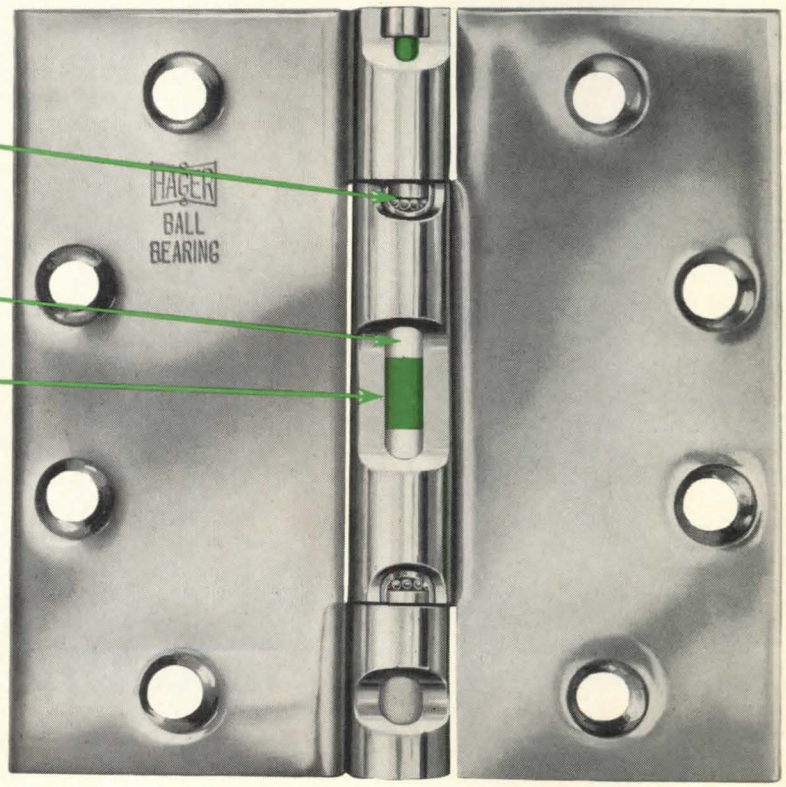
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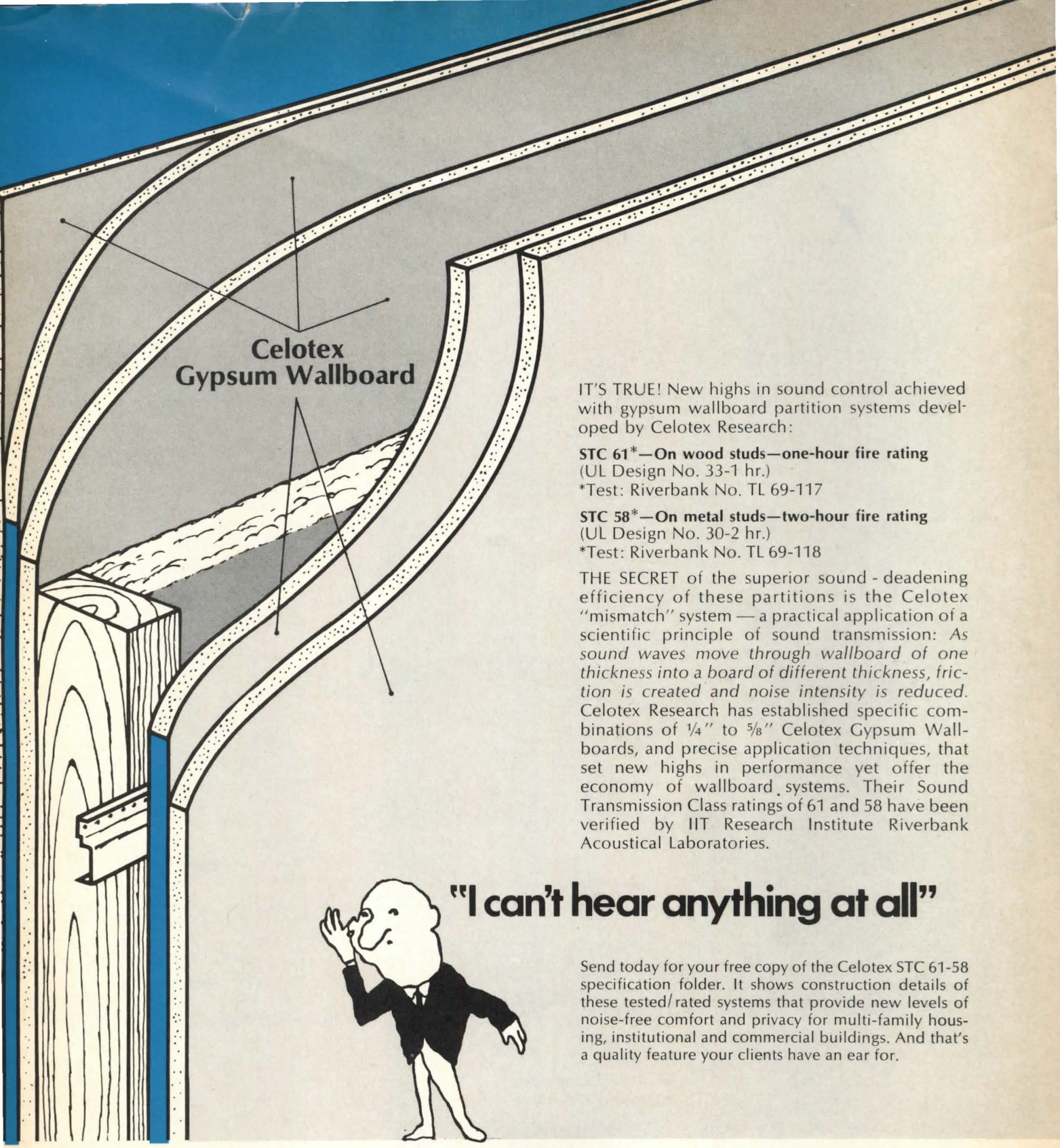
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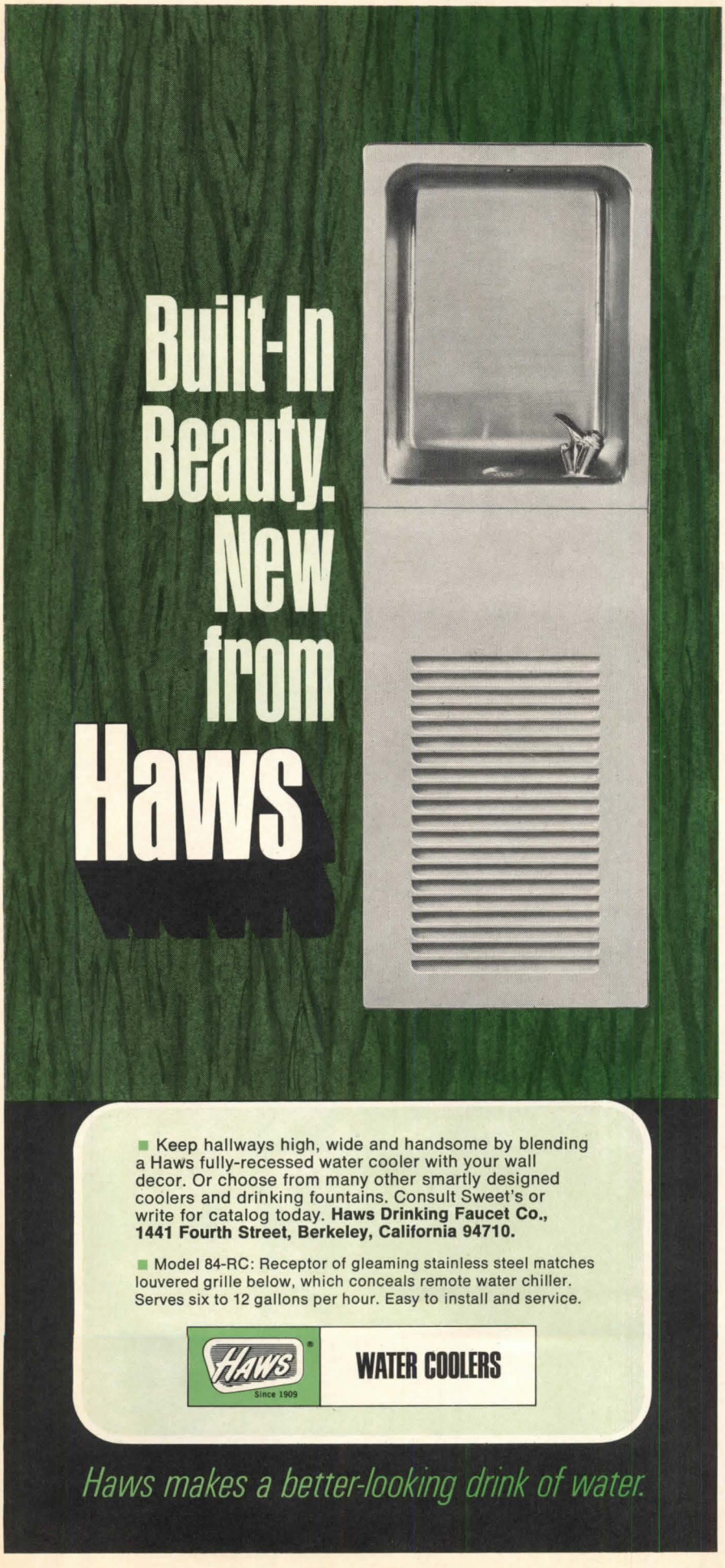
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Continued from page 6

cape the constraints of nonsupportive environment have exciting opportunities for meaningful and satisfying practice. The Temple University experience, as you point out, is one of continuing peer collaboration among many disciplines — medicine, management, trusteeship, social science, education, urban planning, industrial engineering, systems analysis, architecture, computer science, and consumers — in which each one stimulated and reacted to the others. We all share Tom Todd's "mixed feelings of accomplishment and frustration" but all of us, Todd included, would do it again.

Incidentally, your story embarrasses me by crediting me with the development and application of computer techniques for planning that are the work, much of it published, of my partner, Welden E. Clark, an architect and computer scientist whose consumption of midnight oil attests to his interest in improving the tools of architecture and planning. I hope you can correct the omission.

JAMES J. SOUDER
Souder, Clark & Associates
Consultants for Health Care Architecture
Tarzana, Calif.

Reform P/A or . . .

Dear Editor: The only redeeming aspect of your Editor's note to my letter published in the February issue was that at least you reacted. Unfortunately, you overreacted in a negative way and missed the point of my writing. The letter was not meant for publication, but only as murmured criticsm in your ear, a reminder to you of what was once a more responsible P/A. I hoped that my letter, combined with criticism from others, might prod you into reassessing your position and role in the architectural community: To make you look at yourself anew, even though and because you are one of the few established architectural magazines in the country. I hoped such letters might make you reflect for a moment on your responsibility to and potential leadership in the profession, not to mention the society at large. I hoped that rather than continuing your present trend toward "super" zoot that you might really get with it in every sense of the word.

Unfortunately, you chose not to do any of these things. You decided to reaffirm your established position, and assert yourselves by stomping on the lone dissenter. Your reaction was much like a cornered, frightened animal, which, unable to maneuver to a more strategic position, turns on his attacker. I'm afraid that trying to put me down won't help

Continued on page 16

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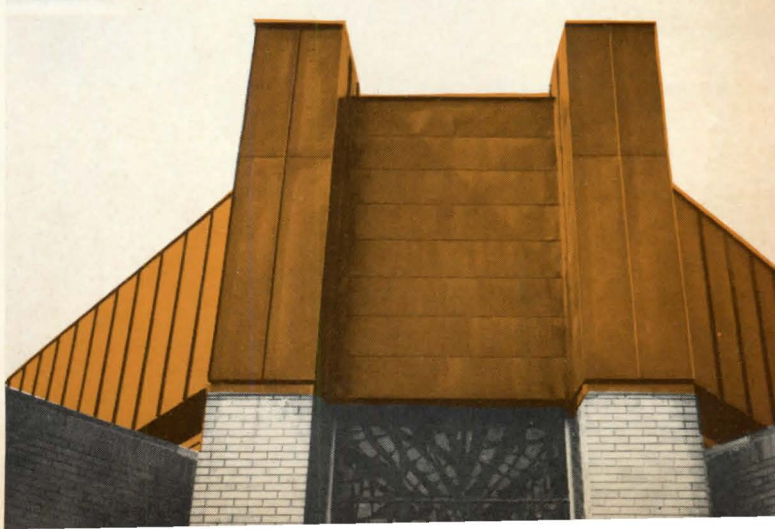
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Continued from page 10

the quality of your magazine, nor does it invite others to submit criticism or promote what could be a healthy dialogue between editor and reader. How else are you to sense and respond to our thinking? Perhaps the real truth is that you are no longer really interested in the reader's opinion, but merely wish to keep your issues full of glossy advertisements.

My real fear for P/A is that you have sold yourselves so far down the river that you have lost sight of, or no longer understand, what the young men in the drafting rooms of "your" offices and the studios of "our" architectural school are concerned with and are talking about. If you don't start to listen, you may soon find yourselves in the archives, alongside *Collier's* and *The Saturday Evening Post.*

R. C. WHITE
School of Architecture
Princeton University
Princeton, N.J.

[Regarding your letter, I would like to make the following comments. Since the entire exchange took place prior to my becoming Editor of P/A, I hope you will accept what I intend to be an impartial reply to your letter.

I agree that the title page quote on housing by Michael Harrington was not particularly applicable to our December issue. However, we have done a good deal on housing and intend continuing to do so. The reply to your letter contained in the Editor's note seems, in my opinion, beside the point, and you are indeed justified in your reaction to it.

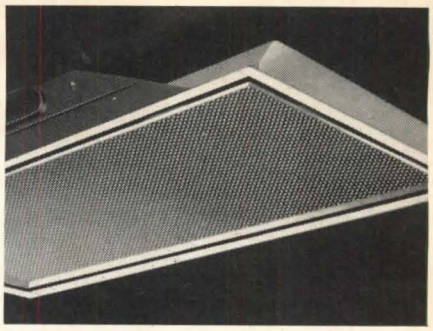
We do intend to appeal to the man in the drafting room. I spent a number of years there, and am in sympathy with the points stated in your letter. I hope that you can be prevailed upon to help us create the "healthy dialogue between editor and reader" you and I both desire.
—FORREST WILSON, EDITOR]

Simplicity Is Beauty

Dear Editor: Sorry to be late with my comments on "Porto" mobilegraphics (JANUARY 1969 P/A). Apparently, it was designed by an "asphalt forest" trailerite. The thought was interesting, but does little to quiet the nerves while in the serenity of the great outdoors. Perhaps the vastness of the desert, the towering redwoods, or our wind-swept coastline is all too terrifying an experience for your designer, who requires the clanging and jarring noises of the city.

As for us, we will continue with our prosaic aluminum "overlander," complete with hot showers, good beds, and ice for martinis.

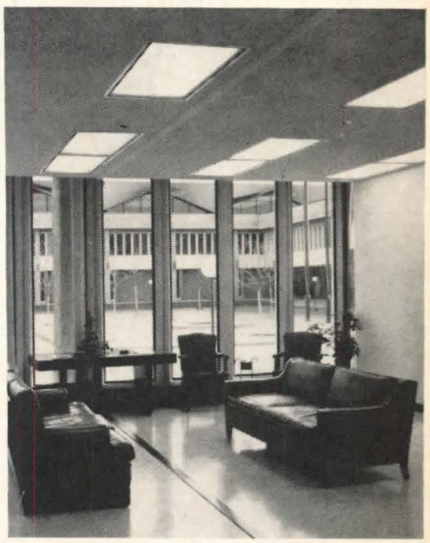
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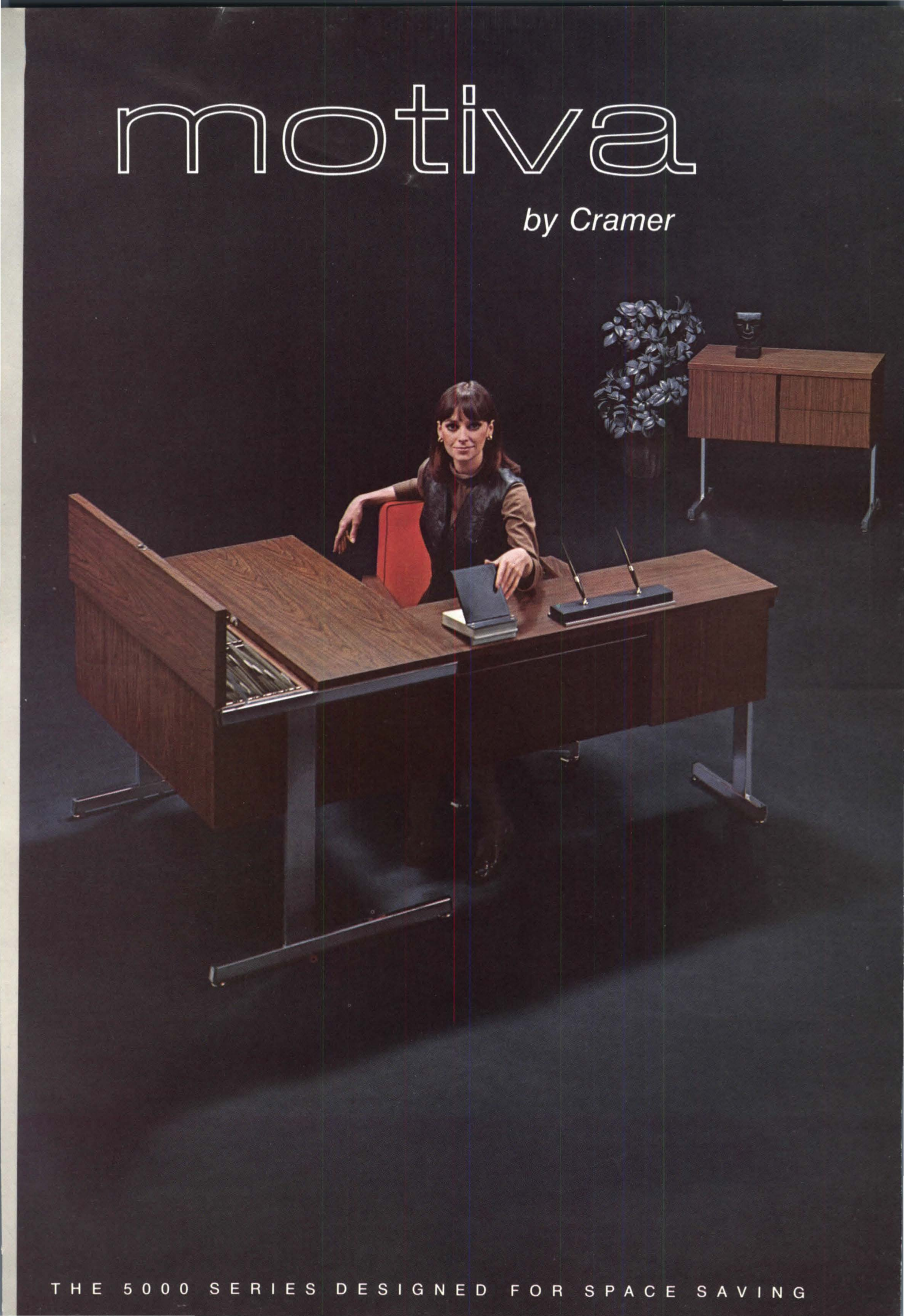
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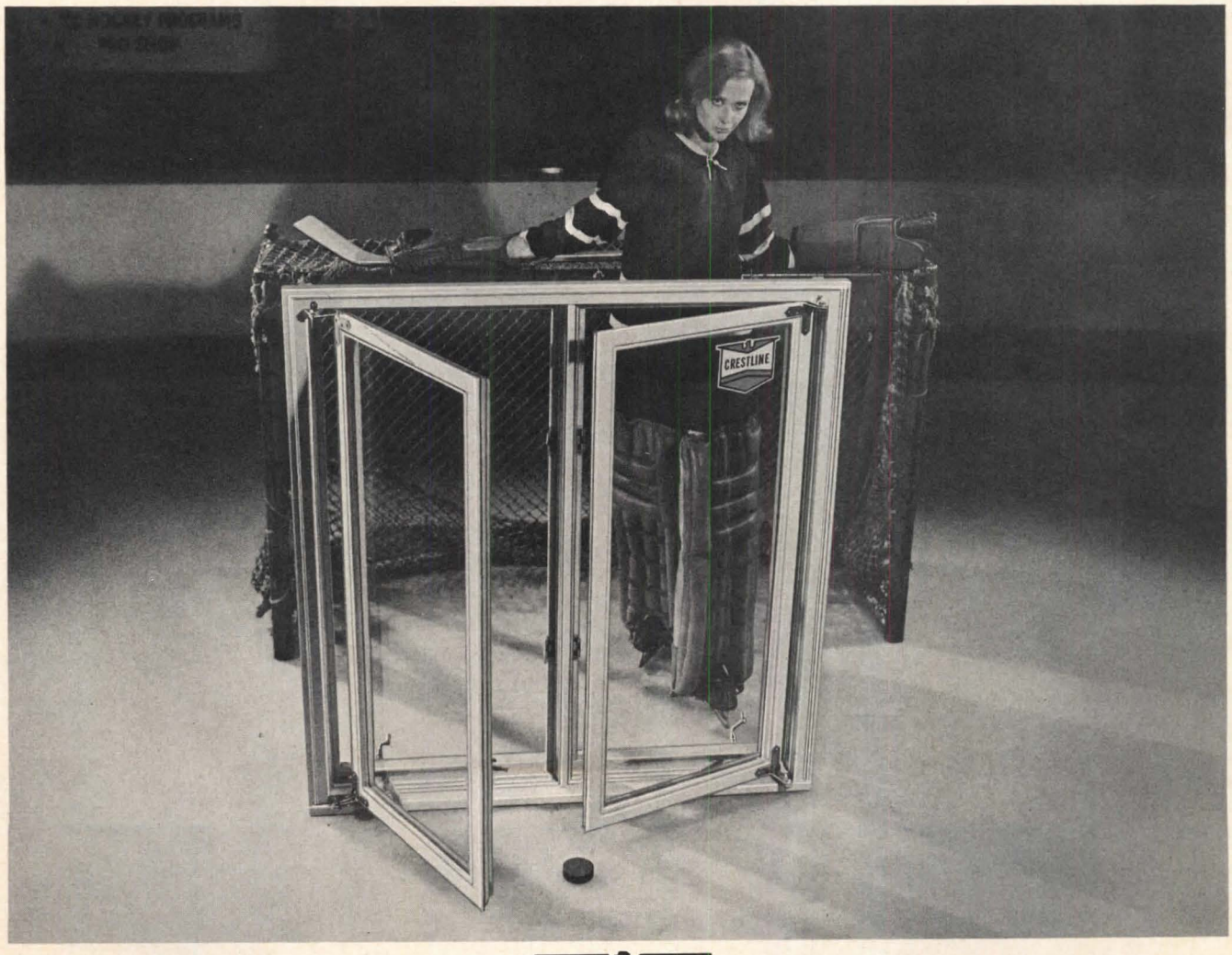
More and more contractors and builders are making a smash hit with home-buyers by putting in the panes that are so easily reglazed without a knock-down-and drag-out fight with the sash.

This new, easy-do sash comes in our new, specially-designed casement windows (they're the casement models with the new 5/8" thick insulating glass), and they're not only thick-skinned; they're also smart.

A quickly-removable wood bead arrangement lets you slip out the broken pane, re-bed a new one, pop the bead back, and forget about it.

It's only one small sample of the kind of good thinking our design people keep putting into the Crestline line . . . adding extra utility, extra life and extra salability, in places you wouldn't think possible.

Which is a good goal to have, because it's making us the top product/service team in a very fast league. Ask your nearest Crestline dealer, or write us in Wausau. Our people know the score.



CRESTLINE®

The wood windows that cut out the callbacks

Home office, Wausau, Wis. Plants at Wausau, Ladoga, Indiana, Corry, Penna., and Petersburg, Va.

See us in Sweet's (S)



RACE SPACE.

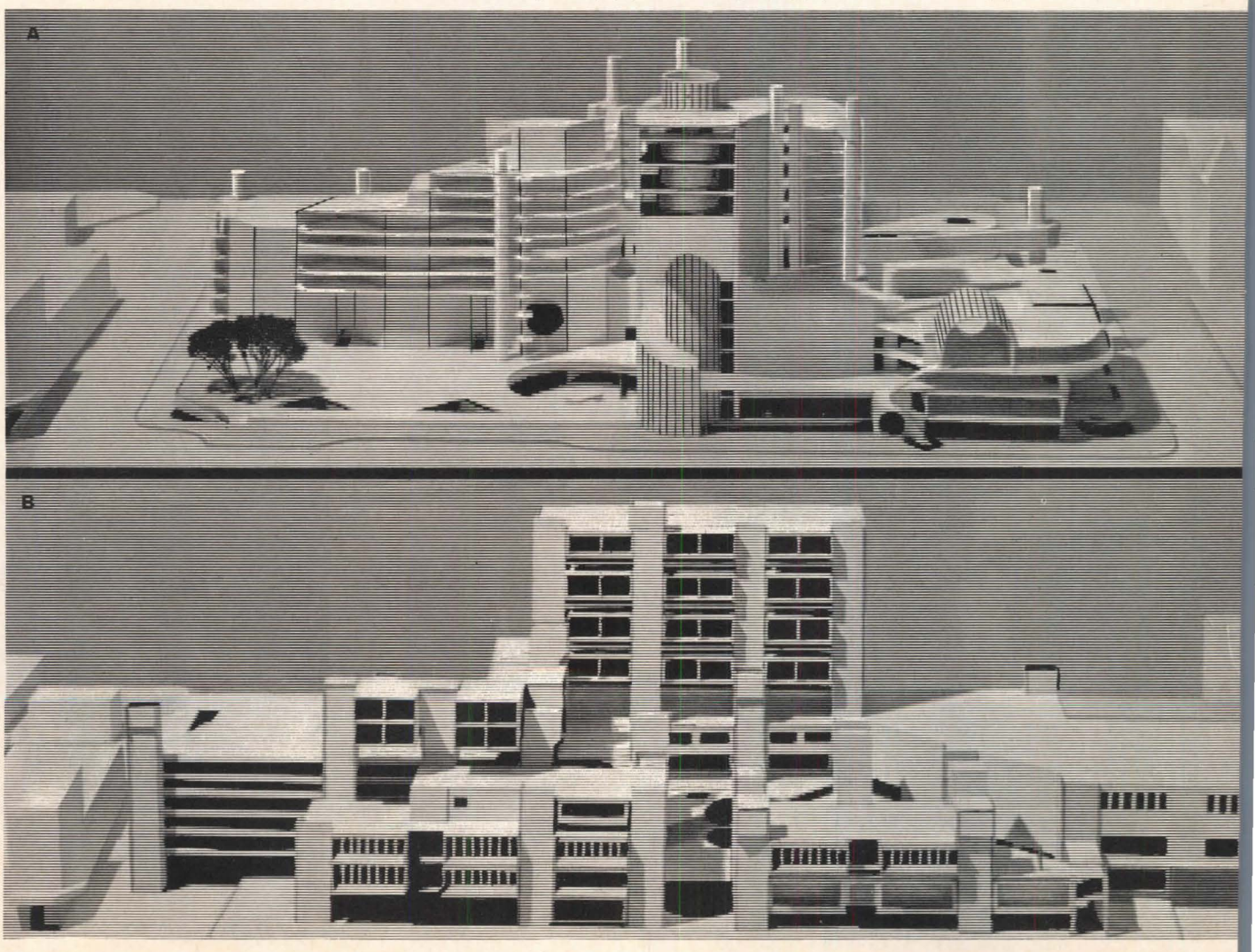
The Everson Museum is only one of the distinguished new buildings throughout America and Europe in which you will find The Race/JG Theatre Seat, designed by Peter Dickinson. For a complete list of installations and brochure, write J G Furniture Company, Inc., Quakertown, Penna. 18951.

JG

The uninhibiting sealant

DAP® Flexiseal® polysulfide sealing systems do away with many of the restraints put on your design freedom by considerations of geometry and type of construction joints to be sealed.

A study for a small urban space of many varied functional requirements, by fifth-year students of Professors Donald Stevens, R.A., and William Widdowson, R.A., University of Cincinnati College of Design, Architecture and Art. The scope of the project is to provide a homogeneous urban environment consisting of stores, shops, offices, apartments, parking and other facilities in a single city block for a community of 75,000. The student proposals shown were designed by (A) Michael Reynolds, (B) James Clark and (C) I. W. Gilliam.



DAP Inc. General Offices: Dayton, Ohio 45401 SUBSIDIARY OF Plough, Inc.

☐ Please send Technical Data Bulletins on DAP One-Part Flexiseal and Two-Part Flexiseal polysulfide sealing systems.

☐ Have representative call on me.

name_____ title_____ firm_____

address_____ city_____ state_____ zip_____

Outstanding field applications prove that DAP Flexiseal polysulfide polymer sealants deliver the dependable sealing performance needed in dynamic or moving joints. After 20 years and more, Flexiseal still gives watertight, airtight protection . . . long after most other types of sealants have broken down. This ability to withstand severe construction joint movement frees you to express new design concepts.

Now DAP offers *two* Flexiseal polysulfide systems. One-part Flexiseal is a new, improved compound with tenacious adhesion and sealing performance superior to ordinary one-part polysulfides.

Two-part Flexiseal features balanced modulus — adhesion is always greater than cohesion — for permanent, positive seals. For technical information on these Thiokol "Seal of Security" approved sealants, please send coupon.

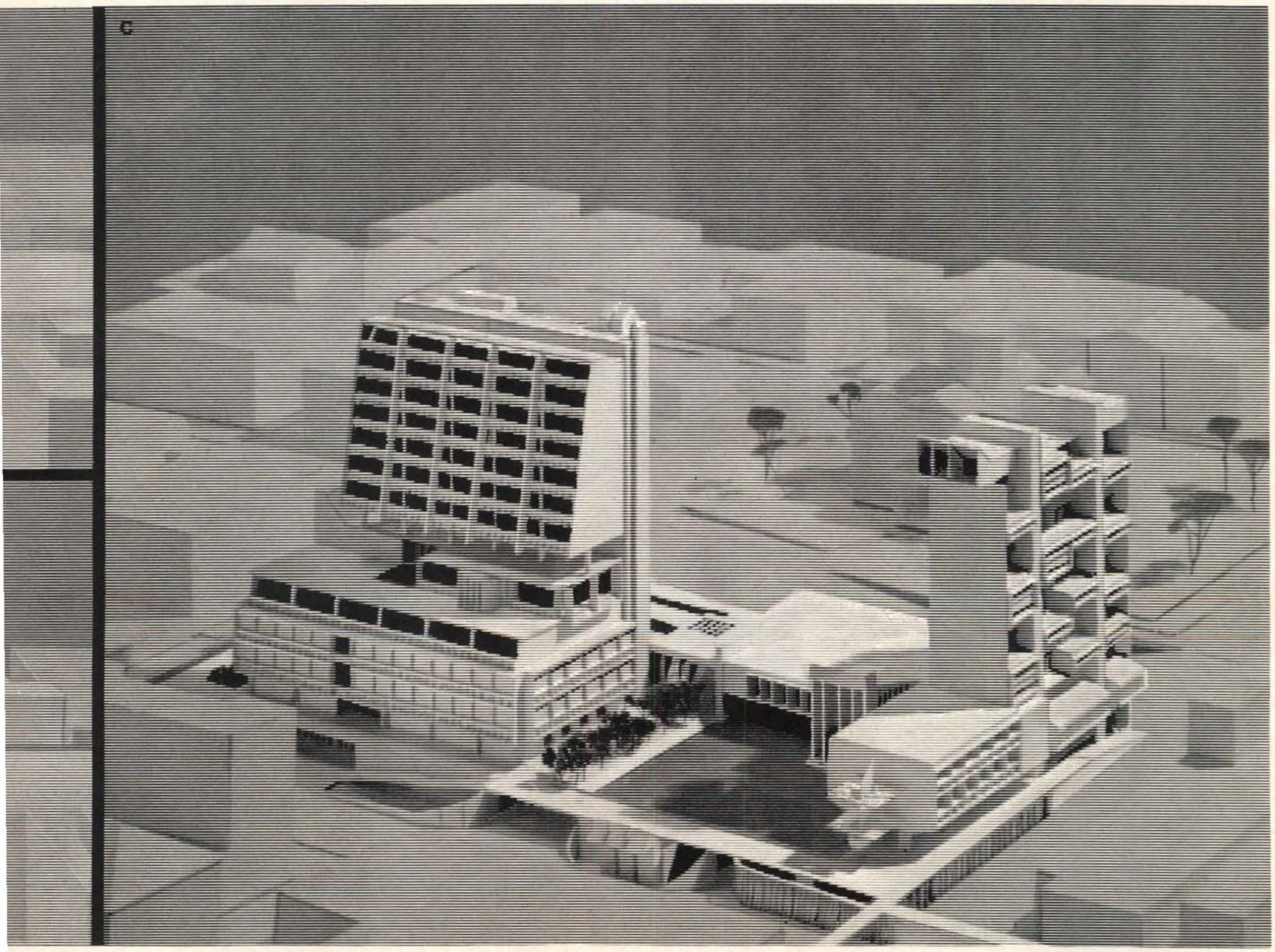


DAP® ARCHITECTURAL SEALANTS

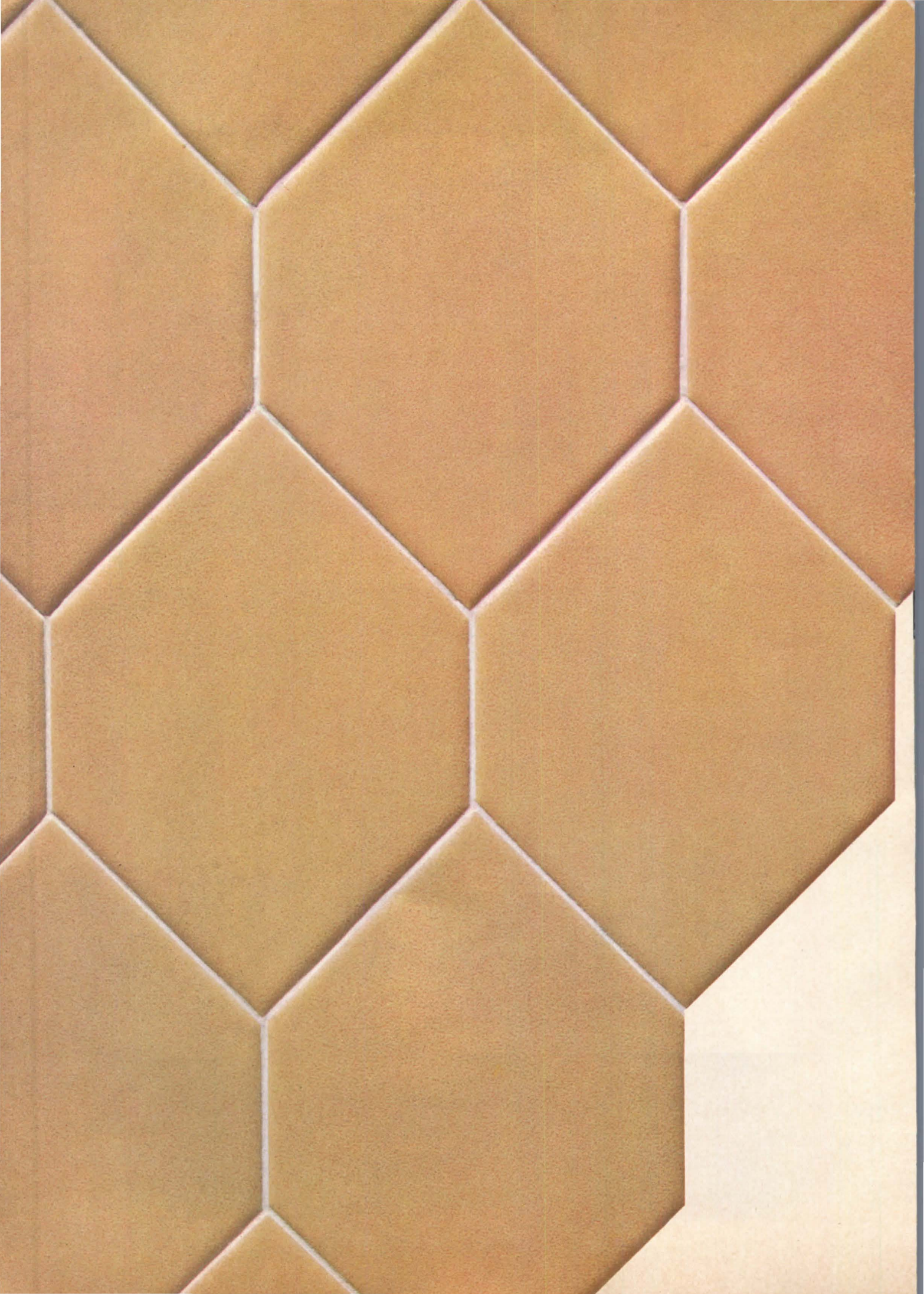
Thiokol LP POLYSULFIDE POLYMER

Proved by time and the Thiokol* Seal of Security

*Registered Trademark of the Thiokol Corporation



On Readers' Service Card, Circle No. 337



Meet the tile that doesn't know where to stop.

Mosaic ceramic tiles climb walls, hit the ceiling, pave the way, and solve more design problems than anyone except you.

The consolidation of the Mosaic and Stylon lines gives you the opportunity to make your selections from the broadest line in the industry. We offer a wide choice of colors, sizes, shapes and finishes. Mosaic is the "just-right" ceramic tile for any application – commercial, residential, industrial or institutional. And . . . floors and walls are color coordinated to permit the harmonious effect you want.

To insure delivery of tile when the job calls for it, Mosaic has 10 plants from coast to coast, 33 regional warehouses and over 150 distributors in every major metropolitan marketing area. Plus over 30 sales representatives available to supply you with samples and product information. And the most complete design service anyone provides.

Here we give Harvest Gold tile full run of a room and spread it clear across the page. For more on what Mosaic tiles can do for you and your work, write: The Mosaic Tile Company, Box 999, Florence, Alabama 35630. We'll send you our complete Architect's Guide. Or if you'd like, a Mosaic representative will deliver it.

MOSAIC® MOSAIC TILE COMPANY
A DIVISION OF STYLON CORPORATION

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Gas Energy makes years of perfect climate a great buy for shopping centers.

These three shopping centers found that the economical way to control climate for years is with Gas Total Energy. That includes air conditioning as well as every other need. And each of the three centers is in an area with its own kind of climate problems. Regency Square is located in Jacksonville, Florida. Chapel Hill is in Akron, Ohio. And Turfland Mall serves a large area of Lexington, Kentucky.

What makes Gas Total Energy so economical? The efficient recovery of normally wasted heat for climate control. In fact, installations of this kind can be twice as efficient as today's best steam electric generating stations.

For example, at Turfland Mall, all of the electricity the shopping center needs is produced by six Gas engine-generators. In the process, heat is also produced. But this heat doesn't go to waste. Because in a Gas Total Energy system the heat is recovered and used for space and water heating. And absorption cooling.

Only Gas Total Energy gives you all this. And dependability you can count on. Because all of the power is produced on the site of the installation.

No wonder more and more architects and engineers are specifying Gas Energy to create the right climate in shopping centers, office and apartment buildings, schools, motels and industrial plants throughout the country.

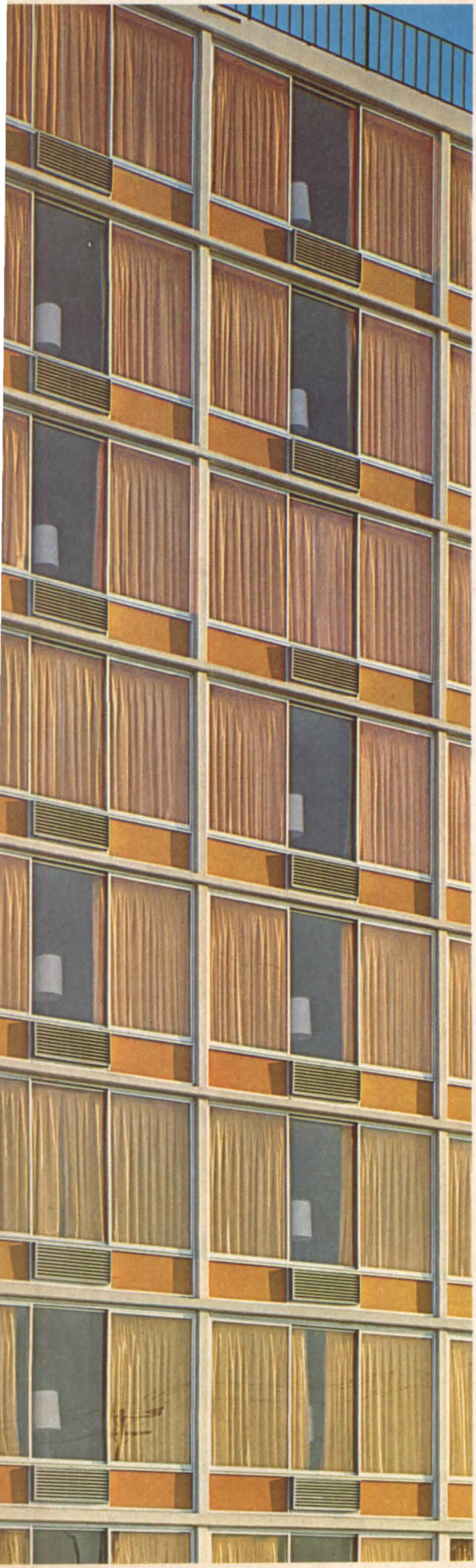
How great a buy can this total approach to energy be for you? Find out from your Gas Company Sales Engineer. He can show you how economical Gas can give you all the energy you possibly need.

AMERICAN GAS ASSOCIATION, INC.

For all your energy needs,
Gas is the natural choice.

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SHOES







Holiday Inn, Anaheim WILLIAM BOND, AIA. (top) Residence Towers, Claremont College LADD & KELSEY, AIA (bottom) Major Western University WELTON BECKETT, FAIA.

You design it. Any design. Then save time, labor and money, with a superior, economical, window/window wall system.

There is one. Ador A-70.

Facts, features, specifications

Proven, for many years, in all types of installations. **HS-A2-HP, hurricane rated, AAMA, with a 16′ wide panel, 8′ center panel!**
Can be installed in front of, between, or behind columns. Both width and height compensation for faulty openings.
Both thermal and mechanical contraction or expansion allowed for. **Any combination of fixed or sliding panels, custom to your designs.**
Architecturally clean, uniform sightlines, no fins. Symmetrical both inside and out, for easy stacking or joining.
Full length pressure equalization slot, no siphoning. **Full tubular sections for horizontal mullions, extra strength and rigidity.**
Quadruple wedge interlocks, extra strength, no rattling. Adjustable mullion for continuous runs before columns of varying widths.
Double weatherstripping throughout. **Slides right or left.** Bypass for high-rise cleaning.
Weatherstrip concealed in panels, for clean appearance, easy replacement. Full length patented flapper valve, no draft, no whistle.
Full screen or half screen for either single or double slide windows. **Fixed panels glazed from interior or exterior, for high-rise convenience.**
Anti-lift-out blocks, no unauthorized removal. Standard lock can be placed at any height (above childrens' reach). **Optional tumbler type locks.**
Stainless steel reinforced locking plungers. **Adjustable, heavy-duty, nylon-tired rollers.** Sealed, permanently lubricated rollers.
Clear or color anodized, to your specification. Air conditioning units in lower panel without extra reinforcing, to 12′ wide.

Send for details.

ADOR/HILITE *2401 W. Commonwealth Avenue, Fullerton, California 92633*
Please send your packet of full and quarter size details, catalog and other information on the Ador A-70.

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company _____

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Shown in Sweets, 1969, as Rusco A-70 . . . 19a / Ru
Write to Ador/Hilite for a free packet of full and ¼ size details, windload charts, other information.

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On Readers' Service Card, Circle No. 435

Tectum solves seven problems for architects at Ohio U. Convocation Center

Under the aluminum sheathed dome, Tectum forms a lightweight, but structurally strong, roof deck. It is also a beautifully decorated ceiling. An insulator with a 0.53 k factor.

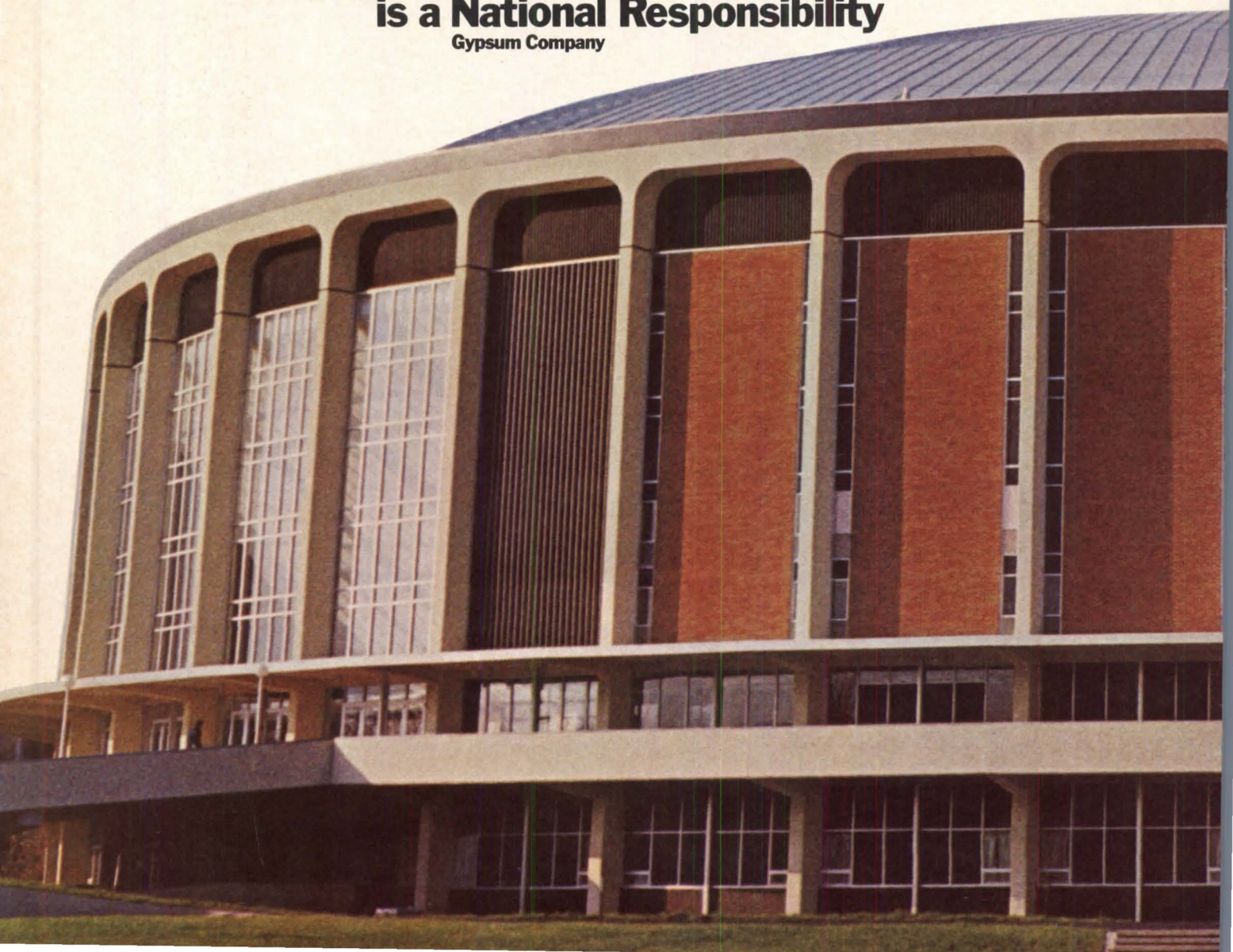
On the walls beautifully textured Tectum offers large-area sound control with noise reduction coefficients up to .80-.90. The large panels go up fast, are amazingly scuff-resistant.

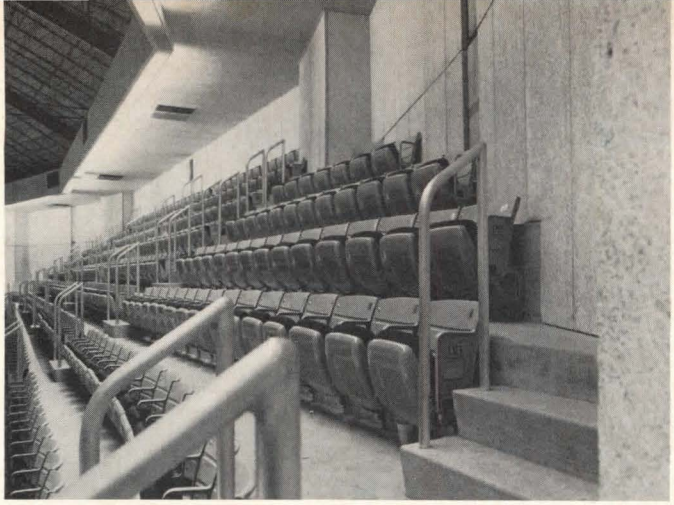
Tectum is noncombustible. It is easily worked on the job to fit contours unobtainable with any other wood fiberboard.

Think first about Gold Bond® Tectum® for any building on your boards. You won't have second thoughts.

Helping you become well rounded is a National Responsibility

Gypsum Company





2-inch Tectum sidewall panels were used on interior walls at high seating bank to achieve necessary acoustical ratings.



CONVOCATION CENTER,
Ohio University, Athens, Ohio

ARCHITECT:
Brubaker/Brandt, Inc., Columbus

CONTRACTOR:
Knowlton Construction Co., Bellefontaine, Ohio

TECTUM DISTRIBUTOR:
Construction Products, Inc., Columbus

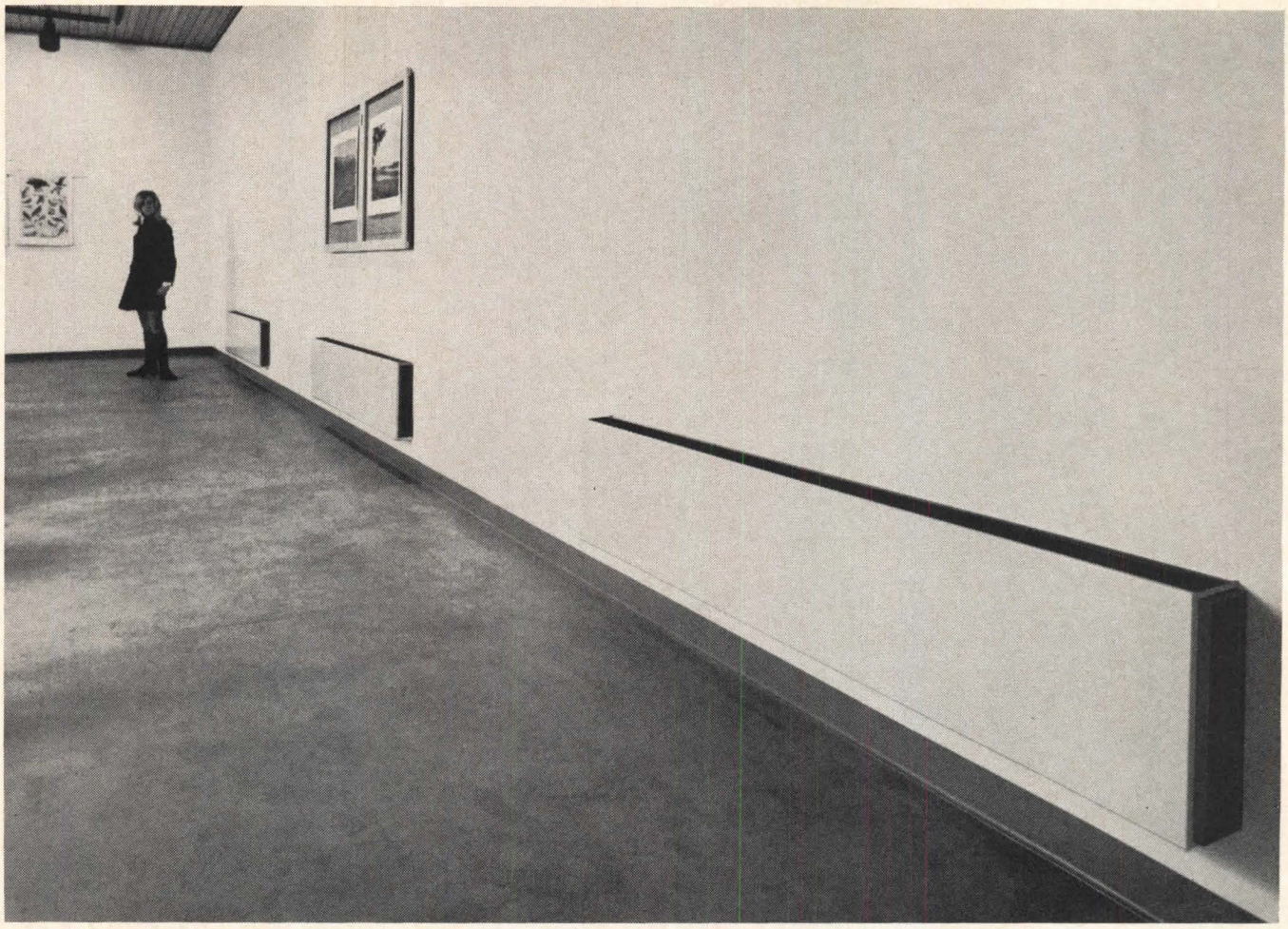
STRUCTURAL ENGINEERS:
Fling & Eeman, Inc., Columbus

Gold Bond®
TECTUM

The name Gold Bond identifies fine building products from the National Gypsum Company. For more information on Tectum, write Dept. PA-59T, Buffalo, New York 14225.

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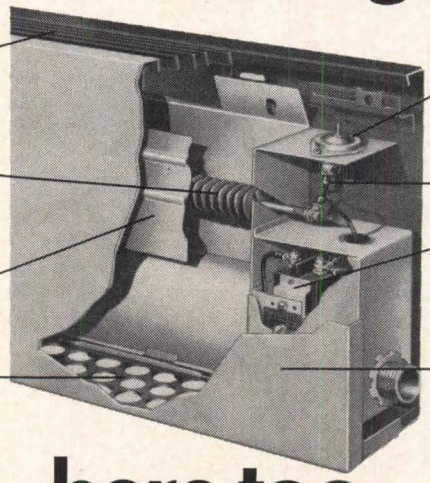
Chromalox® looks good here

DISCHARGE LOUVERS—
Sturdy all steel welded construction will withstand heavy weight and hard usage.

HEATING ELEMENTS—are non-humming, low heat density, shockproof Chromalox Fintubes® with wrap-on steel fins designed for long life.

BAFFLES—Secondary air flow baffles provide cool air passage that maintain front cover temperatures safe to touch.

CONCEALED AIR INLET



OVERHEAT PROTECTION—
full length sensing bulb assures constant protection against overheating from any cause.

FACTORY INSTALLED WIRING

OPTIONAL CONTROLS—
automatic temperature control is available through optional integral line voltage thermostat or separate wall mounted line voltage thermostat.

FRONT COVER—
fabricated from 16 gage furniture quality steel.

here too.

Architectural Sill Line—an esthetically pleasing way to provide perimeter comfort heating in even the most contemporary commercial, industrial or institutional structures. Clean, thin-line styling saves space and fits harmoniously with all architectural wall systems and interior surfaces. Available in a selection of baked enamel decorator colors. Chromalox Architectural Sill Line works with any air conditioning system to give year round individual room temperature control. Provides warm air "draft-barrier" protection against cold window downdrafts. For detailed information call your Chromalox representative. Or write directly for Design Manual F 31101. WC-102

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Antron® puts up with the daily grind

McCarran International Airport knew that even 3,400,000 people a year wouldn't faze Antron.*



So they installed 9,000 square yds. of "Design III" by Lees.



When a carpet has to look good despite both wear and dirt, it should be made of "Antron" nylon by Du Pont.

When McCarran International Airport in Las Vegas became the world's first carpeted airport, they wanted more than just prestige and luxury. They needed carpeting that would improve the acoustics, morale and safety, muffle the jet turbine whine and solve the complex and hazardous maintenance problems they had faced with hard-surface flooring.

The solution simply had to start with "Antron"—the dirt-defying nylon from Du Pont. Lees "Design III" was the choice, loomed of continuous filament "Antron". Lees describes "Antron" as "the fiber combining the longevity and toughness of nylon with the resistance to soil appearance, low static generation, and some of the other aesthetic characteristics formerly only associated with natural fibers."

"Design III" is the carpet that proved itself more than equal to millions and millions of visitors at the New York World's Fair "without apparent wear." Its performance there convinced the officials of the McCarran International Airport that it could do the job for the 17,000,000 travelers they expect in the next five years.

So far the decision to put "Antron" to work has paid off in reduced injury claims, improved acoustics and easier, more hazard-free maintenance.

Why don't you look into "Antron" for your next job? For the complete "Antron" story and information on other Du Pont fibers, write: Contract Carpet Specialist, Du Pont Carpet Fibers, Rm. 16F5, 308 E. Lancaster Ave., Wynnewood, Penna. 19096.

*Du Pont registered trademark.
Du Pont makes fibers, not carpets.

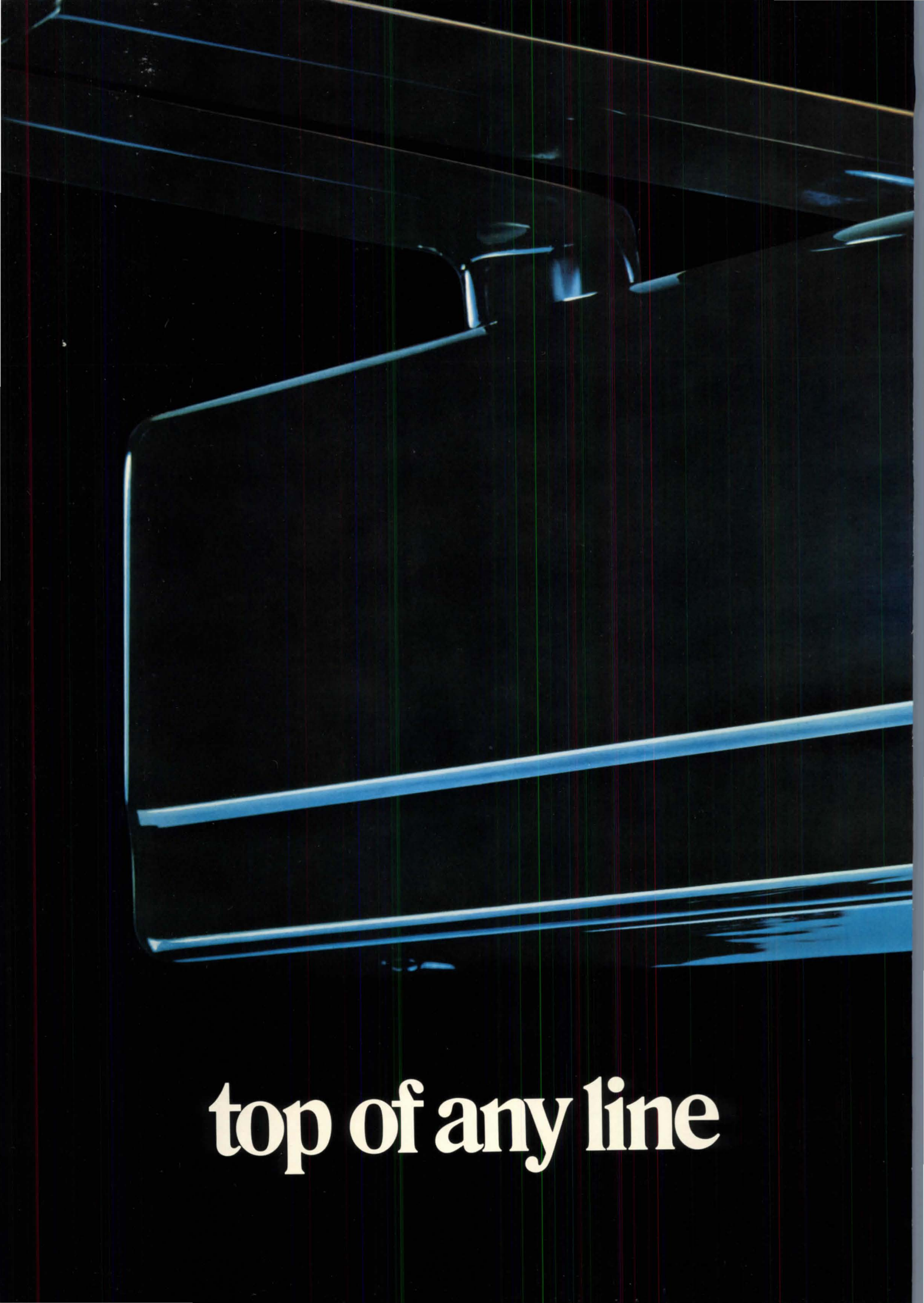
Visit Du Pont at Room 1097.

neocon CHICAGO

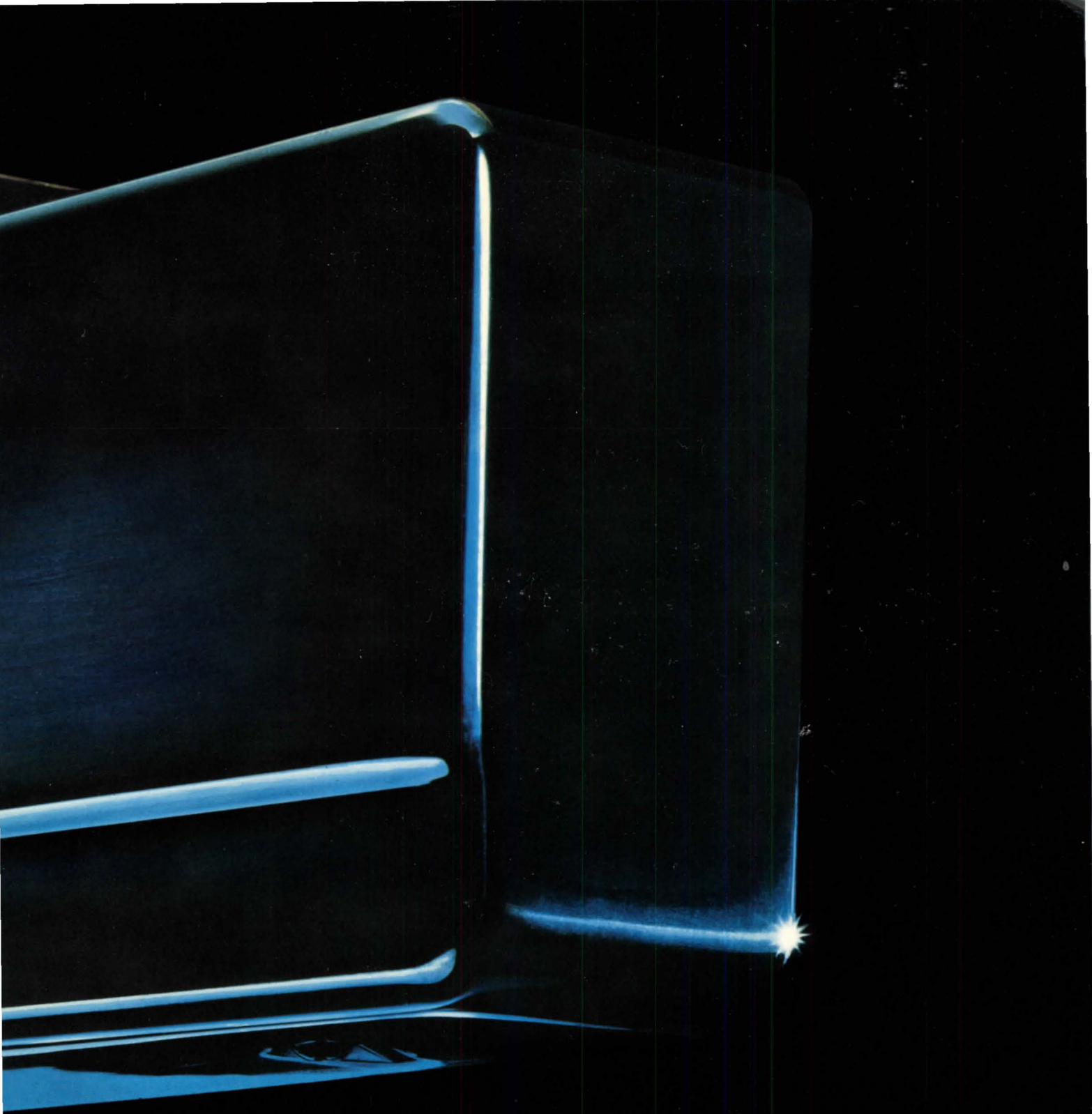
DU PONT
REG. U. S. PAT. OFF.

Better things for better living
...through chemistry

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top of any line



the Powerglide® 150 door closer

o point in superlatives. Let's just say that now all the atures you want in a door closer are on tap in one mooth, good looking package. The ultimate refine- ent of the tested Powerglide line, the top of any line.

or one thing, the 150 series closer will handle any oor. It can be inverted, even on a corner bracket, and omes complete with a special backcheck selector alve for standard or parallel arm applications.

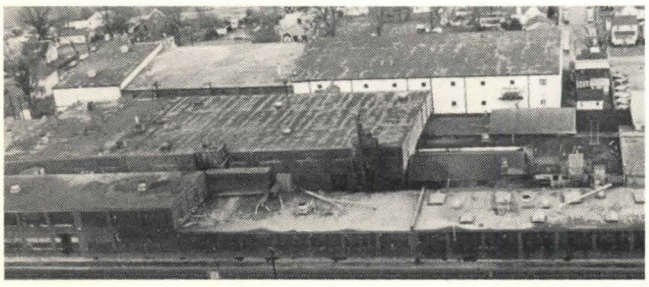
he new closer is designed to control effectively a full nge of door sizes. Its adjustable spring can be tuned give a minimum of 50% extra closing power to ompensate for any conceivable installation, location, air flow pattern. For hospitals and other special stallations, your customer can "dial" delays in its closing cycle. Finally, the trim, heavy-gauge cover that conceals the massive machinery of the 150 series closer blends in and belongs. The nonferrous bronze or aluminum cover is available in all standard plated and sprayed finishes.

For full details on this product of more than 80 years of door closer experience, write: Sargent & Company, 100 Sargent Drive, New Haven, Connecticut 06509 • Peterborough, Ontario • Member Producers' Council

SARGENT®

A complete line of advanced architectural hardware, including the Sargent Maximum Security System.

a J-M asbestos built-up roof that's 57 years old and still wearing strong.



John M. Browning, president of Browning Mfg. Co., saw gray on one of the roofs of his Maysville, Ky., plant. Since it was 40 years old, he feared the worst.

But the discoloration proved to be merely oxidation of the asphalt coating, which revealed the color of the asbestos fiber. The roof was recoated and now, 17 years later, it's still wearing strong.

Customer satisfaction like this leads to repeat business. (Right now Browning Manufacturing is finishing a large new plant addition. It's being topped off by J-M asbestos smooth surface built-up roofing.)

But long roof-life is just part of the story. Johns-Manville asbestos smooth surface built-up roofing needs less bitumen than organic felts. Organic roofs require about 300 to 400 lbs. per square of gravel or slag. Asbestos roofs need none. Results: big savings in time, labor, and money. And a much lighter roof.

You can visually check a smooth-surface roof by just taking a walk on it. Gravel surfaces require annoying, often expensive trouble-spotting to uncover leaks or defects.

Figuring cost-per-year, a J-M asbestos smooth surface built-up roof is a smart way to lower "overhead" overhead.

For details, write: Johns-Manville, Box 290-BI, New York, N. Y. 10016. Available in Canada and overseas. Cable: Johnmanvil.

JM
Johns-Manville

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Rule: All houses should have standard windows.

Make it easy on yourself. Keep 'em plain; keep 'em ordinary.

Stick to the tried, the true and the trite. You won't have made a mistake. Or a reputation.

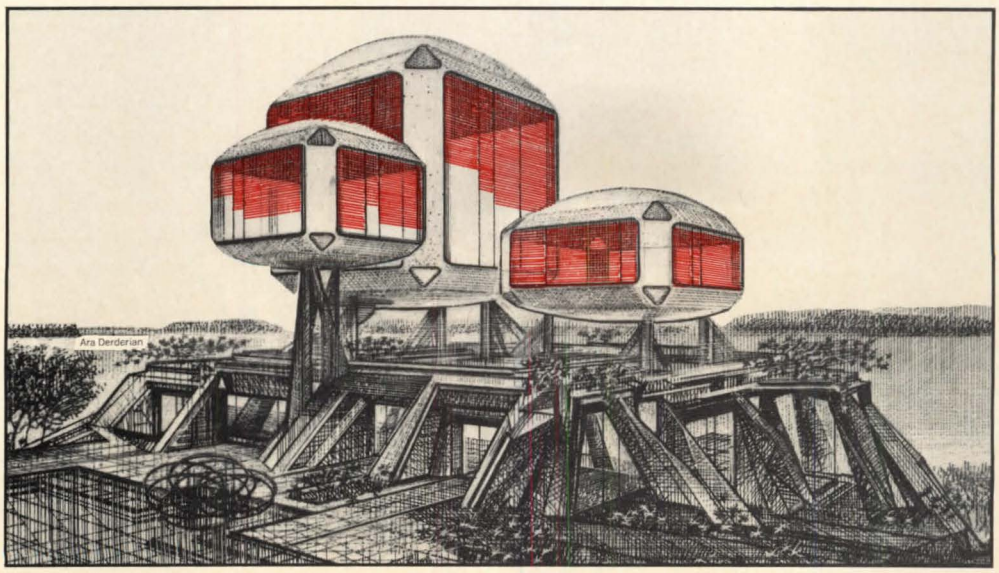
But if you dare to explore new directions, we're with you.

Experiment. Expand your vistas to include a little glistening unorthodoxy. And a lot of visual excitement.

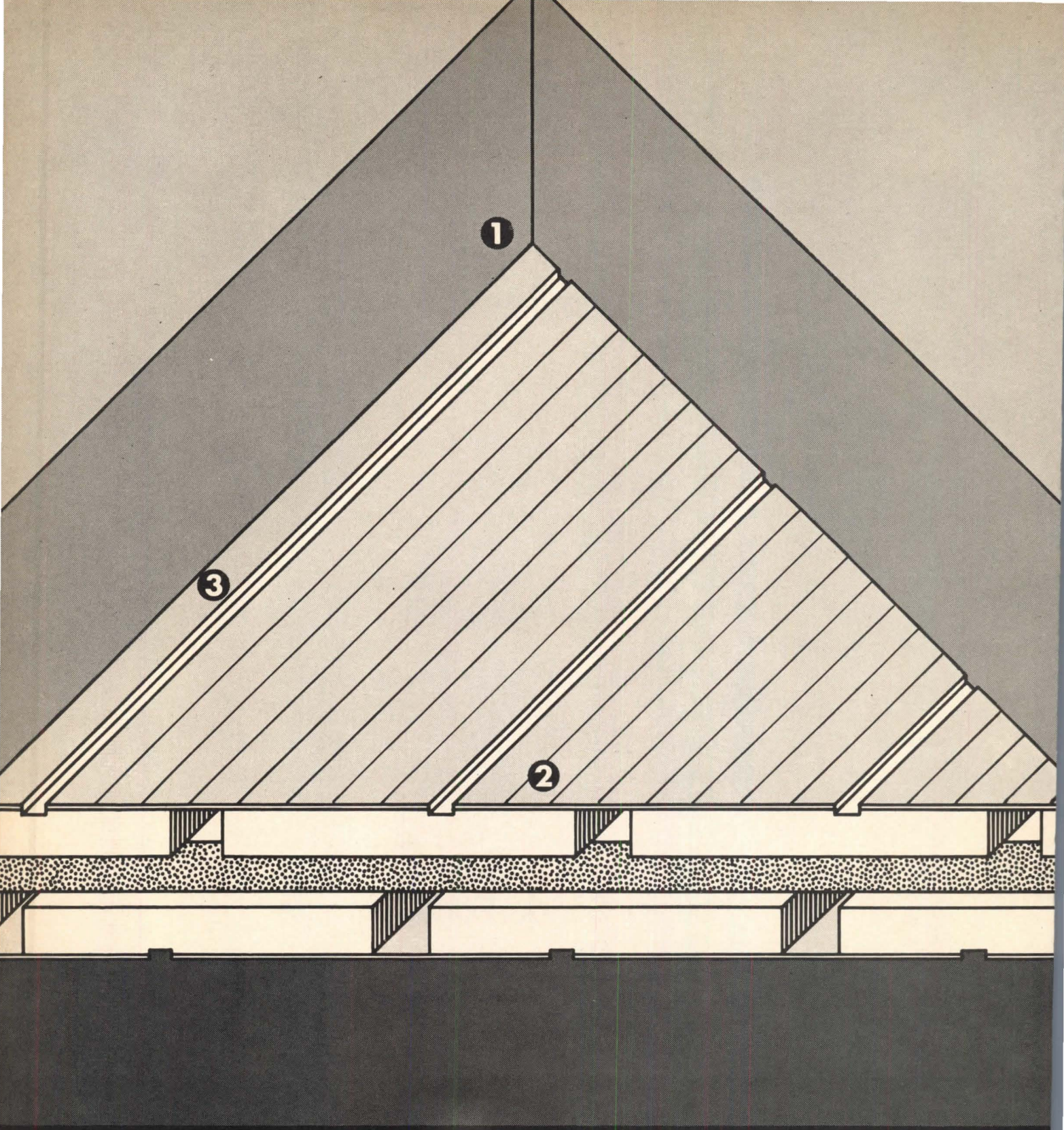
Don't worry about practicalities. We've got your windows covered, with the most efficient light-and-air-and-privacy controlling window covering ever known. In colors and styles you've probably never known about.

But they're easy to find out about. Just put us to your test. See how far we can go together.

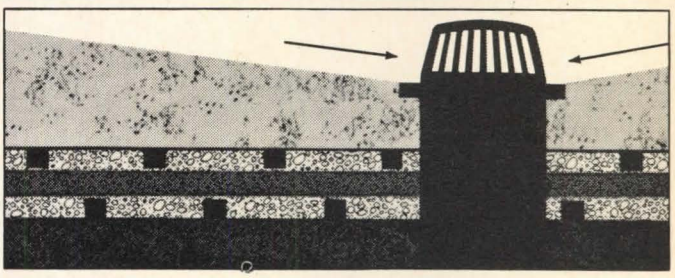
Levolor Blinds. For architects who break the rules.



ARCHITECT ARA DERDERIAN LINED HIS DREAM HOUSE WITH LEVOLOR'S NEARLY INVISIBLE RIVIERA BLINDS. THEN COLORED THEM RED FOR CONTEMPORARY CLOUT. TO FIND OUT HOW THEY'LL WORK FOR YOU, WRITE LEVOLOR-LORENTZEN, INC., 720 MONROE ST., HOBOKEN, N. J. 07030



New double-insulated Dyzone roof deck is self-venting



1 On top, a layer of seamless, permanent Zonolite lightweight insulating concrete that can be sloped to drain easily and economically. Leak-making ponds don't stay on the deck.

2 Below, Dyfoam Ventboard. It's composed of Dyfoam expanded polystyrene boards sandwiched between laminating material. The insulating concrete combined with Dyfoam Ventboard gives you economical U values down to .03.

3 Vents are built right into the Dyfoam Ventboard. Water vapor passes through the laminating material into the vents, and is channeled out to the edges of the roof.

No joints, no tape, no adhesives, no vapor barrier are needed. A thin slurry of Zonolite insulating concrete serves as the bonding agent between deck and structure.

Zonolite roof decks can only be applied by trained, approved applicators. Upon completion, the decks are certified to meet specifications.

ZONOLITE® GRACE

Construction Products Division W. R. Grace & Co.
Dept. PA-05 Cambridge, Mass. 02140

Gentlemen: Please send me complete information and specifications on DYZONE roof decks right away.

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CITY_____ STATE_____ ZIP_____

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You can tell a Pro by what's in his pocket

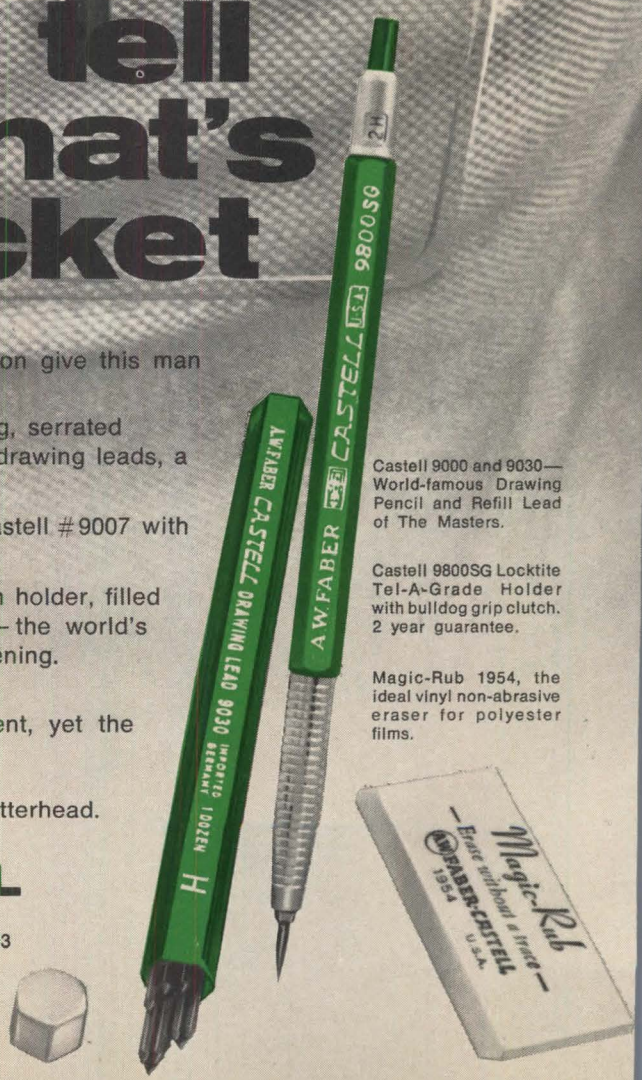
Three A.W. Faber-Castell products poised for action give this man the confidence he needs in his daily creative work.

Castell 9800SG Locktite Lead Holder with the long, serrated functional grip. It's filled with Castell #9030 refill drawing leads, a quality famous the world over.

Castell #9000 drawing pencil of the masters or Castell #9007 with an eraser to whisk away mistakes.

Castell Microlette #9502 push button repeat-action holder, filled with Microlette #9020 ultra thin drawing leads — the world's thinnest — for superfine lines. Never needs sharpening.

Many pros carry their own Castell combinations.
Each with its complete range of degrees, different, yet the same in never-varying uniformity in grade, line width and opacity. For a sample of your favorite degree, write today on your company letterhead.



Castell 9000 and 9030— World-famous Drawing Pencil and Refill Lead of The Masters.

Castell 9800SG Locktite Tel-A-Grade Holder with bulldog grip clutch. 2 year guarantee.

Magic-Rub 1954, the ideal vinyl non-abrasive eraser for polyester films.

A.W. FABER-CASTELL
Pencil Co., Inc.
41-47 Dickerson Street, Newark, New Jersey 07103



P/A NEWS REPORT

Progressive Architecture's Monthly Digest of Buildings, Projects, People and Products *May 1969*



Dotted line shows area of proposed landfill, with sketch of Emery Roth-designed office structure superimposed on aerial view of lower Manhattan. New York Stock Exchange would be at location shown by second pier from right in dotted area.

NEW STOCK EXCHANGE BUILDING TO RISE FROM EAST RIVER LANDFILL

NEW YORK, N.Y. The New York Stock Exchange will move in 1976 from its present Wall Street location to a new $155-million home to be built on landfill in the lower East River, just east of the site where the world's largest privately owned office building is presently under construction. Both plans are part of an unprecedented cooperative effort involving developers of the structures and the City of New York.

Architects from Skidmore, Owings & Merrill and New York Stock Exchange staff members still are discussing specifics of the design. Preliminary estimates are that the structure will have to accommodate about 2 million gross sq ft, with a trading floor of about 90,000 sq ft (three times the present floor area).

Gustave L. Levy, chairman, and Robert W. Haack, president of the Stock Exchange, said in their announcement, however, that the structure must be completed by about 1975.

They have also insisted that the building be sufficiently flexible structurally to meet future developments in automation of Exchange activities or a possible conversion to office space in the event of relocation of the Exchange. This was probably a veiled threat to the city. Two years ago, when the city proposed raising taxes on stock transfers, the Exchange announced it would not remain in the city. A compromise was worked out with Mayor Lindsay, who has called the new plans the "keystone of an offshore building development" — one that would contain new housing and office buildings.

It is projected that the landfill development will add about 29 acres to the city's shoreline, with the Exchange occupying 4 acres. The building is expected to cost $102 million for construction, $33 million for technical equipment and furnishings, and $20 million for land rental, real estate taxes, and financial charges during the construction period.

ROTH DESIGNS OFFICE STRUCTURE

NEW YORK, N.Y. The 3,500,000-sq-ft office structure next to the Exchange site is designed by Emery Roth & Sons. It will have a 53-story tower and an attached 15-story wing rising from a 4-block superblock created by the closing of two city streets. As part of the package worked out in collaboration with the City's Office of Lower Manhattan Development, a 40,000-sq-ft, raised plaza will be constructed on the eastern part of the site, to align with the proposed landfill. The plaza will correspond to the third floor of the buildings, with main entrances at grade level on the Water Street side. The Franklin D. Roosevelt Drive will be rerouted to run beneath the plaza.

Under the agreement, the owner, Uris Buildings Corporation, also has promised to rebuild the city-owned Jeanette Park southwest of its site, and will provide underground concourses to connect with proposed future subway extensions. Landscape architects Lawrence Halprin & Associates will design the park and the plaza.

COMPETITIONS

Deadline for the Shinkenchiku **"Residential Design Competition"** for faculty housing in a university village is September 1. For information, write: Shinkenchiku-Sha Co., Ltd., 31-2 Yusihma 2-Chome Bunkyo-Ku, Tokyo 113, Japan. . . . Entries are being accepted through May 15 for the 1969 **Prize Bridge Competition** sponsored by the American Institute of Steel Construction. Any steel bridge completed within the U.S. in 1968 is eligible. Details: American Institute of Steel Construction, 101 Park Ave., New York, N.Y.

X-5: THE MOST VERSATILE DOOR CLOSER EVER INTRODUCED

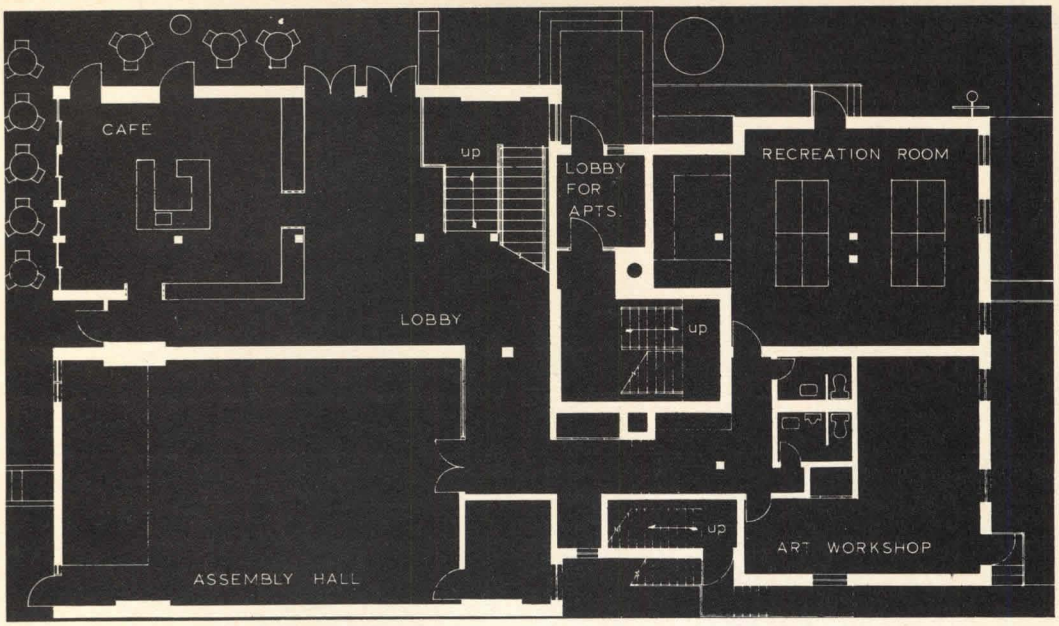
Shallow depth... removable without removing the door... for stock doors and frames... butt hinge, offset or center pivotal hanging... including "Quick Spotter" installation fixture. For all interior doors. Install it in a prepared floor in 7 minutes... replace it in 3 minutes... and make most repairs in 2 minutes. Full control panel adjustments. Proven: Extremely reliable.

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Plan shows first-floor layout of the Townhouse, with café and recreation room opening onto the park. The second-floor study center is above the assembly hall and the library over the art workshop, leaving the rest of that level devoted to classroom and office space.

DEVELOPING A PROJECT — AND A FUTURE

NEW YORK, N.Y. Two vest pocket parks and an educational and community center, called the Townhouse, are under construction in a program designed and developed by a young, dynamic organization called the East Harlem Real Great Society. RGS endeavors to encourage the Spanish-speaking East Harlem residents to control the physical development of their own environment.

Founded in 1964 by a group of Lower East Side youths whose careers as gang leaders had been interrupted by time spent in reform school and prison before they developed their self-help group, the RGS began by organizing programs in education, and economic and physical development. In 1967, an East Harlem headquarters was opened.

In 1968, the Vincent Astor Foundation gave the group $50,000 to continue operating the rapidly expanding educational programs, and to purchase two city-owned old-law tenements in the center of East Harlem to convert into the RGS Townhouse. Preliminary plans for the Townhouse were begun by Richard Rinzler of RGS, who was then an architecture student at Columbia, and the buildings were purchased for $6700 in March 1968. The adjacent lot was bought for $4500 and is being converted into a vest pocket park.

The first two floors of the townhouse will be used for educational programs, community activities, and the RGS headquarters, while the upper three floors will contain 12 apartments. One of the two original buildings was unoccupied, but the other housed eight families. The apartments in the unoccupied building will be completed first to avoid the problems of relocating the tenants. These tenants were interviewed intensively by John Zeisel, a Columbia University sociologist, to determine their physical and social needs. Through arrangements with the Municipal Loan Program, a three-bedroom apartment will rent for $80 per month, a price the tenants can afford. The RGS portion of the building will be financed through private contributions.

Among the programs planned are: a prep school for high school drop-outs, study center for college students, tutorial and counseling center, leadership program, English language program, library of Puerto Rican and Black History, art workshop, café, recreational activities, and the RGS Urban Planning Studio, which provides free architectural and planning services to the community.

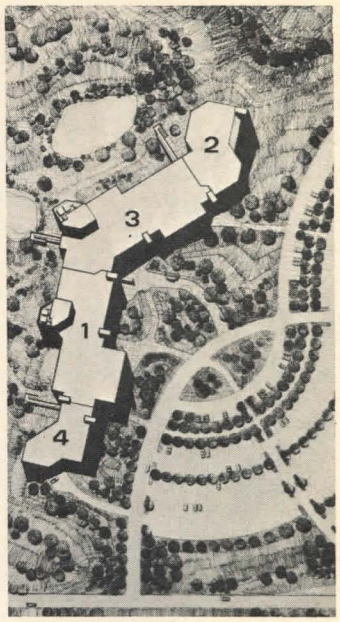
The UPS was started as an "experiment in architectural education" with the Columbia School of Architecture. The Studio began with RGS staff consultants, architectural students, and eight local youths hired as trainees.

Now, the UPS is in transition from an experimental, student-dominated office to a fully professional organization. At present, the staff consists of: director and architect, Harry Quintana; two architects, Richard Rinzler and Mauricio Gastón; two part-time architects, four consultants, and ten Columbia students.

The Studio is now working on the following projects: Afro-Latin Unity Council Headquarters, Cooperative Housing Block, East River Urban Renewal Area Study, and five vest-pocket parks. The parks will be constructed by local youths who are currently being trained by the Young Citizens for Progress in a program funded by the Ford Foundation.

P/A MOVES TO CONNECTICUT

The Reinhold Publishing Corporation is moving its offices to 600 Summer Street, Stamford, Conn. 06904. P/A will operate from this address as of the beginning of May. The telephone number is 203-348-7531.



Numbers indicate construction phases leading to completed megastructure.

FIGHTING CAMPUS COLD

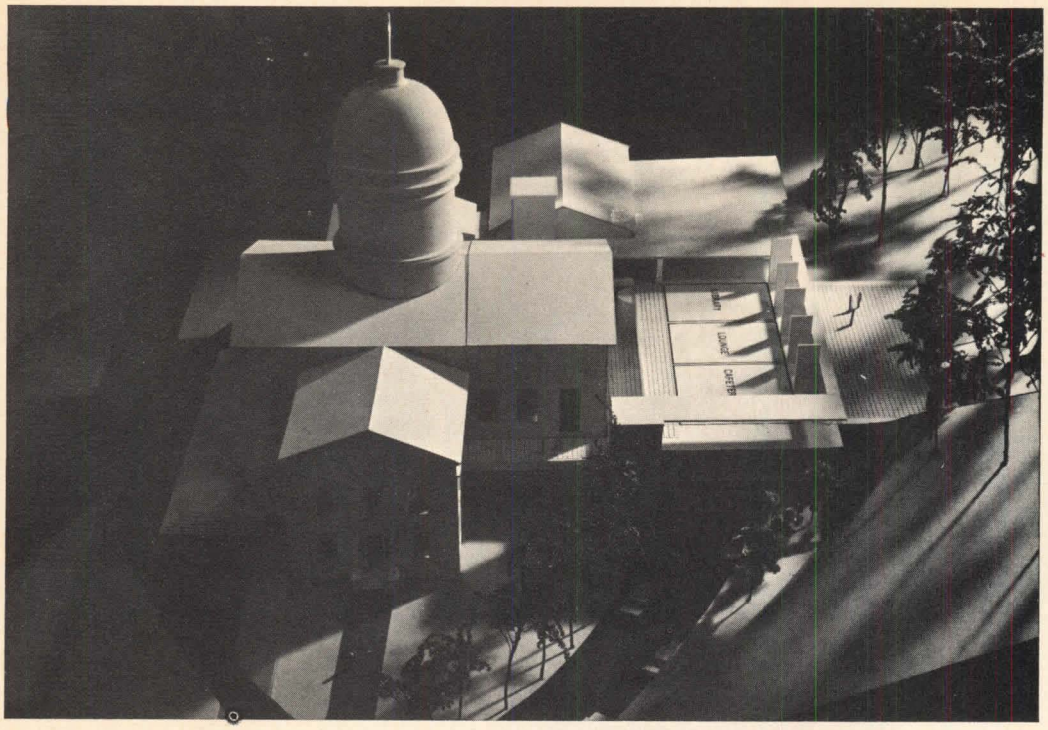
WHITE BEAR LAKE, MINN. In recognition of the extremely cold winters of this northern region, the design for the new Lakewood State Junior College uses a megastructure concept to provide a climate-controlled environment for students moving between classes. The structure will be composed of four interconnected elements, sited for minimum exposure to the north.

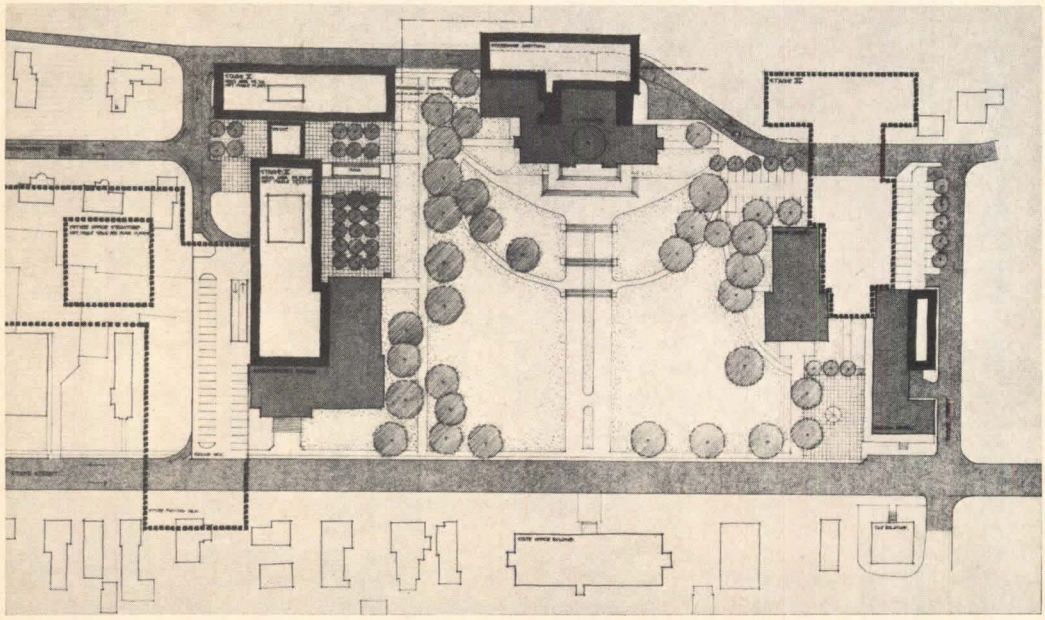
The master plan for the suburban commuter school is by Grover Dimond Associates, Inc., of Saint Paul. The megastructure is designed for eventual enrollment of 3000 students, with parking for 2000 cars.

The first three-story element, with 92,000 sq ft of space for 1500 students, is due to be completed by next January. This phase will house administration, library, and exhibition areas; computer facilities for the entire 18-unit state junior college system; and classrooms for the departments of practical arts, science, and humanities.

An activities section will be completed the summer of 1970, and a humanities element equal in size to the first section will be added in the summer of 1972. The fourth phase, a fine arts section that includes a theater, is tentatively scheduled for construction in 1973.

On Readers' Service Card, Circle No. 381





Above: *Model of the Vermont Statehouse and area of proposed addition.* Below: *Heavy lines indicate proposed additions to existing buildings, and dotted lines indicate area for parking and possible future expansion to the left of Statehouse Green and new office structure on right.*

HOUSING THE BUSINESS OF GOVERNMENT

Government is a business that gets bigger all the time, and new structures to house this growing business are being planned, designed, developed, and opened throughout the U.S. The most recent state capitol to be completed is the widely publicized Hawaii statehouse, designed by John Carl Warnecke & Associates with Belt, Lemmon & Lo (see JUNE 1961 and JANUARY 1962 P/A). Among the proposals being considered are these three for the state governments of Vermont, Michigan, and Maryland.

Maryland

The Gruen Associates, Inc., plan recently completed for the Maryland State Governmental Center in Baltimore would incorporate the area now occupied by three buildings into a formal expanding complex that would closely relate to the surrounding residential neighborhood.

The three buildings — the State Roads Buildings, Employment Securities Building, and State Office Building — form a state center initiated in 1956 as part of the Mount Royal Plaza Urban Renewal Area. The state has, however, outgrown them and leases additional offices throughout the city, leaving the three to stand aloof and alone amid their neighbors.

The Gruen plan would set up a formal complex of multistory office blocks to be built on a quadrangular plan around landscaped courtyards. Expansion could proceed a quadrangle at a time, with parking garages at ground and lower levels of every courtyard. An elevated walkway system would link all buildings to a central, covered promenade, connected by escalators to the garages and vehicular drop-off points at ground level. Agencies expecting large public attendance or offices serving the public, such as libraries and meeting rooms, would be located on the pedestrian level, with waiting spaces in interior landscaped courtyards.

In addition to scaling the buildings to no more than 10 stories to relate to the physical environment, the plan urges the state to recognize its social responsibility and use the complex to offer amenities lacking in that environment. It proposes that the complex allow space for civic and community facilities — parks, playgrounds, perhaps an outdoor theater — as well as commercial facilities along the promenade, all to bring life and activity to the center after normal working hours.

Vermont

A computerized system for analyzing space requirements, linked to personnel and work task information already handled by computer, is the basis for determining specific future construction in the master plan developed for the Vermont State Capitol complex in Montpelier by Robert Burley of Waitsfield, Vt. Major projects included in the plan are a 170,000-sq ft office building, restoration of the 1838 Statehouse and an addition to house legislative functions, restoration of the historic Pavilion Hotel on the east side of the Statehouse Green to be used for additional offices, parking facilities, and revision of traffic around the Green.

Burley said his goal in the Statehouse addition was to make it part of the landscape rather than an architectural statement that would conflict with the Statehouse itself. The addition would not alter the appearance of the Capitol as viewed from the green and would be linked to the existing structure by a two-story skylit gallery. A mezzanine level overlooking the gallery would contain legislative dining facilities, a lounge, and a library, and would be open to a hillside terrace.

The proposed office build-

ing would be set back from the face of the present administrative building, with the north wing turning toward the Statehouse to define the corner of the Green. The upper floors cantilever beyond the base to provide larger, more flexible spaces for the Highway Department engineering staffs, and the lower-level cafeteria would be glass-walled to provide a view of the Statehouse.

The immediate construction program will cost an estimated $16 million.

Restoration work has begun on the existing Statehouse. No funds for new construction have been allocated as yet, however, pending settlement of the current Vermont Legislature controversy on whether to follow the plan's recommendation to restore the Pavilion Hotel or to demolish it.

Associate Architects are Malcolm H. Appleton and Jonathan M. Hall, with John Calbreath Burdis of Albany as planning consultant.

Michigan

Forced into the classic mall concept by the existing site, the plan proposed by Smith, Hinchman & Grylls Associates for the controversial new Michigan capitol in Lansing seemingly breaks with tradition by separating the three divisions of government.

The key word here is "seemingly," since the structure actually is one building with four continuous levels below the raised plaza and three squat towers rising three levels above the plaza. Sigmund Blum, partner in charge of design for the Detroit firm, said the plan was meant to express the independence of the three government branches while using the total space available for auxiliary operations. The capitol would cover a base of 850,000 sq ft, including parking space for 1200 cars.

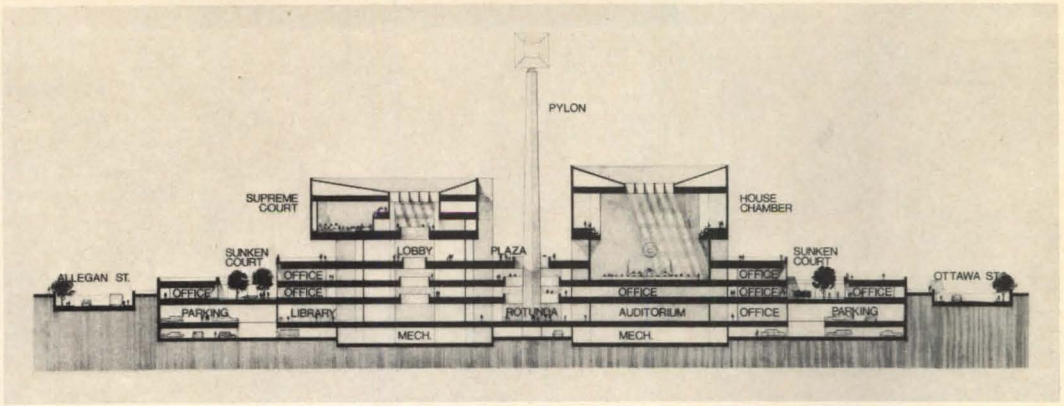
The first level houses mechanical and electrical facilities and staff parking, with public parking, an auditorium, computer, food, storage, library and health and services on the second floor around the open rotunda. The State and House chambers are on the fourth floor. Office and meeting rooms on the third and fourth floors — which overlook the open courtyard around the raised plaza — are planned to meet both present and future needs.

From the raised plaza, the three skylighted tower elements are entered via recessed doorways, with lobbies and waiting rooms on this level. The larger unit houses the upper portions of the House and Senate chambers, with galleries on the fifth and sixth floors. The two-level Supreme Courtroom is entered on the sixth floor, corresponding to the location of the governor's office in the third element.

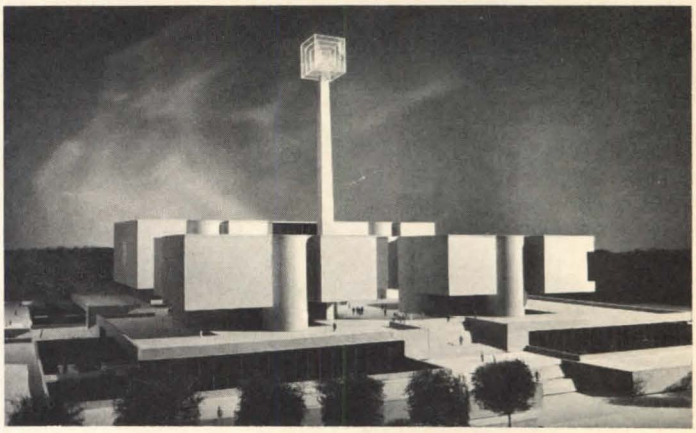
The central feature of the plaza area would be a pylon soaring up from the rotunda, topped by a symbolic illuminated beam.

The building would be of reinforced concrete, veneered granite, and glass, with the exterior surface of limestone to relate to the limestone buildings already on the mall. Construction costs are estimated at $50 million.

The new capitol has been the subject of a long-running debate in Michigan. Legislators first decided to build additions to the present classic-domed capitol and use the land at the opposite end of the mall for parking. Persuaded to use the site for both building and parking, the state leaders turned down the first Smith, Hinchman & Grylls design, which would have called for three inverted pyramids, although then-Governor George Romney spoke highly of the plan. A $30 million first phase of expansion was approved, however, and three new state buildings are near completion along the mall.



Cutaway shows seven levels of Michigan Capitol design from the Supreme Court side.



View from existing capitol.

Model of Maryland Government Center planned by Gruen Associates.

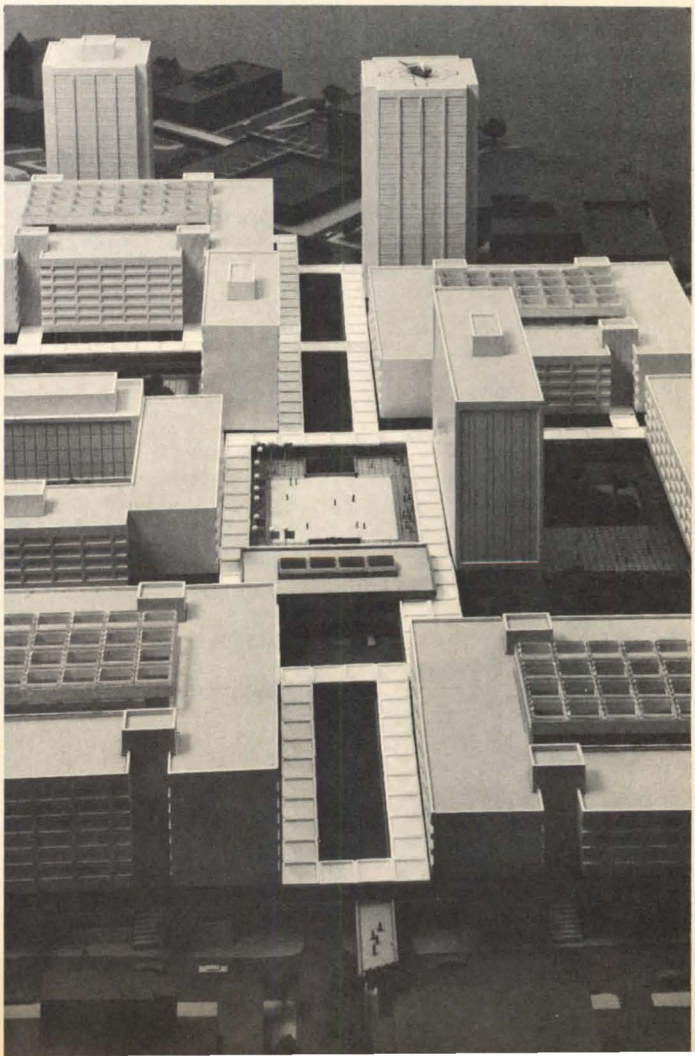


Photo: Jack Laxer



MURAL DEPICTS HISTORY OF MATH

LOS ANGELES, CALIF. More than 500,000 individually cut pieces of imported Italian Byzantine glass and split-faced marble were used in the 14 bas-relief panels that make up the frieze on the new Mathematical Sciences Building at UCLA. The largest polychromed bas-relief ever created by an American artist, the mural by Joseph L. Young, now chairman of the Department of Architectural Arts at Brooks Institute of Fine Art in Santa Barbara, depicts the history of math from cave man to space man. The work uses 50 colors of glass, weighs more than 40 tons, and covers more than 1032 sq ft of wall. Eighty-ft-high cranes were required to lift the 6-ft-tall precast concrete panels into place on the three exterior walls of the two-story lecture hall section of the building.

The $4-million structure is the third phase of a four-part building program begun in 1950 for the School of Engineering Complex. The unit, which is constructed of concrete and reinforced masonry, has 141,355 sq ft of space to house classrooms, offices, and laboratories of the departments of mathematics, meteorology, and astronomy, and the campus computer center. The multi-domed rooftop provides for telescopes and a planetarium. Architects were J.E. Stanton and William F. Stockwell of Los Angeles, with Welton Becket & Associates as consulting architects, in collaboration with James Westfall, head of UCLA Campus Architects and Engineers.

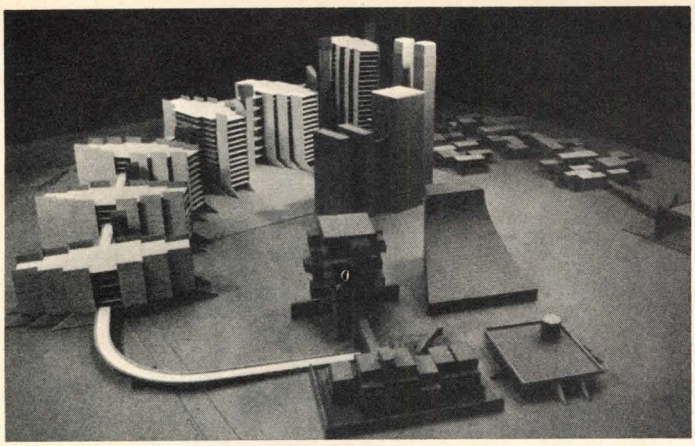
Among projects previously completed by Young are the mosaics on the west apse of the National Shrine of Immaculate Conception in Washington, D.C., a marble, granite, and mosaic bas-relief mural for the exterior of the auditorium of the Los Angeles County Hall of Records, 12 bas-relief panels for Shalom Memorial Park near Chicago, and the 6′ x 36′ cantilevered mosaic mural for the main lobby of the Los Angeles Police Facilities Building in the new Civic Center.



SCHOOLS

The **University of Michigan** will offer a doctor of architecture degree starting in the fall. The doctoral program will require at least two years of advanced work beyond the six-year master's program. . . . A new two-year graduate program in urban design will be established at the **Rice University** School of Architecture in the fall of 1969. It will lead to the degree of master of architecture in urban design, with the city of Houston serving as a study laboratory. . . . **Pratt Institute** has established a Department of International Programs to develop facilities for exchange of students and faculty members with institutions abroad. Dean Emeritus Olindo Grossi of the Pratt School of Architecture will direct the program. . . . The **University of Virginia** has established a Center of Housing and Social Environment to explore criteria that can be used in housing design on a large scale. H. Cassius Higgins, British architect and urban designer, will be in charge of the teaching and research unit. The university also has announced the addition of an architectural history course to the 1969 Summer Institute it will sponsor at the University of Salamanca, Spain, June 17 to August 25. . . . A program of special field workshops has been inaugurated in the Department of Architecture at **Pennsylvania State University.** The workshops in Bellefonte, Johnstown, and Philadelphia enable 50 students to observe serious environmental problems and to work with local and regional authorities on the solutions to these problems. . . . The **University of Colorado at Boulder** will continue as design and development center for an eight-state region of the Office of Civil Defense, under a $25,-449 grant from the Department of the Army. The center, administered as a department in the School of Architecture, is headed by Associate Dean of Architecture G. K. Vetter. . . . John F. White has been elected president of the **Cooper Union for the Advancement of Science and Art.** He has been president of National Educational Television since 1958. A $40,000 grant has been awarded to the Center for Urban and Regional Studies at **Virginia Polytechnic Institute** by the Department of Housing and Urban Development for training and research in urban transportation. The project is entitled "An Analysis of the Public Decision Making Process as it Relates to Transportation." . . . A new six-year course of study leading to the Master of Architecture degree is being offered at the **University of Southern California.** The new course will replace the former five-year Bachelor of Architecture degree program and provide a broader general and professional education. . . . Civil Engineering Technology and Architectural Engineering Technology are now being offered in two-year courses leading to Associate in Applied Science degrees at **Sandhills Community College, Southern Pines, N.C.** . . . **Rutgers at Newark** will offer an evening course entitled "New Developments in Urban Housing" to provide information for planning and developing housing projects for low and moderate-income families. . . . **Cornell University** has appointed James W. Yarnell director of its Planning Office. He will be in charge of the university's office responsible for long-range campus development plans. . . .

John Ely Burchard, Dean Emeritus of **Massachusetts Institute of Technology,** has been named Thomas Jefferson Memorial Foundation Professor of Architecture at the **University of Virginia** . . . Bernard Spring, currently director of research at the Center for Urban Environmental Planning, **Princeton University** School of Architecture, has been named dean of the new School of Architecture at New York's **City College** . . . The government of Thailand and **Southern Illinois University** have instituted a joint mission to develop new products and train problem-solving designers. Basic objectives of the Design Development Program are to set up a facility in Bangkok for training, research, testing, and marketing new products.



TAMPA PROJECT FIRST UNDER 236

TAMPA, FLA. Construction is scheduled to start by September on a proposed $20-million Federal housing project that would make Tampa the first city in the nation to use Section 236 of the Housing Act of 1968. Designed by C. Randolph Wedding of St. Petersburg, the 25-acre Tampa Presbyterian Village complex will have low- and high-rise condominium units for moderate-income families; there will also be recreational areas, a church and community center, and shopping and service facilities.

"We hope to develop the kind of cultural environment that will prevent re-creation of slums," explained Wedding. "Pride in home ownership is a positive force which fosters responsibility and produces good citizens. Since the entire tract is bounded by natural barriers (the Hillsborough River, Interstate 75 and North Boulevard), this project offers a unique opportunity for complete environmental control. The result will be a model community that maintains the character of a close-knit village."

Developed in conjunction with the Tampa Urban Renewal Program, the project is sponsored by a special-purpose corporation of the Presbytery of West Florida of the United Presbyterian Church. Under Section 236, families in the $3000–$7000 income bracket will be able to purchase units in the Tampa project for a down payment of 3%. Mortgage payments are not to exceed 20% of the family's adjusted monthly income.

According to Wedding, the project will eventually house more than 2000 people, with the final phase scheduled for completion in late 1972. The initial phase will include an 11-story, 68-unit high-rise, plus 32 units in a two-story, garden-type development.

Diaz, Seckinger & Associates of Tampa is the mechanical and structural engineer.

CALENDAR

The 1969 AIA Convention, meeting jointly with the **Royal Architectural Institute of Canada:** Palmer House, Chicago, June 22–26. The theme, "Focus 5," is based on the transportation, urban, and economic problems architects must face in the next five years. . . . The first **National Exposition of Contract Interior Furnishings:** Chicago, June 22–27, at the Merchandise Mart. . . . **The American Society of Landscape Architects,** annual meeting: St. Louis, June 15–20. Theme: conservation and urban land problems. . . . **International Design Conference:** Aspen, Colo., June 15–20. Effects of economics, politics, science, and philosophy on the designer will be discussed. Registration forms: The International Design Conference in Aspen, Box 664P, Aspen, Colo. 81611. . . . **Construction Specifications Institute,** annual convention: Houston, June 2–4. The theme will be "International Conference on Industrial Construction." Information: Eugene M. Dutchak, Director of Publications, CSI, 1717 Massachusetts Ave., N.W., Washington, D.C. 20036. . . . **Carnegie-Mellon University** conference on High Speed Ground Transportation, May 13–15. Information: Dr. James Romauldi, Transportation Research Institute, C-M University, Schenley Park, Pittsburgh, Pa. 15213. . . . **M.I.T.'s School of Architecture and Planning** course: "Computer Aided Urban Design," June 17–27. Information: Director of Summer Sessions, Room E19-356, M.I.T., Cambridge, Mass. 02139. . . . **Environmental Design Research Association,** annual conference: University of North Carolina, June 8–11. The conference is sponsored by the School of Design at North Carolina State and the Department of City and Regional Planning at the University of North Carolina. . . . **Pennsylvania State University's College of Engineering:** 16 continuing education seminars on architectural and engineering subjects through the summer. For information: Conference Center, Pennsylvania State University, University Park, Pa. 16802. . . . **The 19th Annual Summer School Planning Institute:** Stanford University, July 7–11. The subject: "Planning Innovative Schools." Information: Coordinator, 19th Annual Institute, School Planning Laboratory, School of Education, Stanford University, Stanford, Calif. 94305. . . . **The Apartment Builder/Developer Conference and Exposition:** New York Hilton, May 12–14. Various aspects of ghetto housing problems will be explored. Information: AB/DC & E., National Expositions Co., Inc., 14 W. 40th St., N.Y., N.Y. 10018. . . . **The 1969 Study Tour of International Design,** departing from New York and Seattle, June 13. Leningrad's Hermitage, Moscow University, Scandinavian and lowland country design centers will be key sites. Information: Richard D. Roselle, Industrial and Interior Designer, White-Henry-Stuart Building, Seattle, or Scandinavian Airlines in New York or Seattle. . . . **The 1969 Athens Month,** organized by the Athens Center of Ekistics: Athens, July 7–August 1. Activities will include fifth annual meeting of World Society for Ekistics and an International Seminar on the Future of Human Settlements.

Photo: Fred W. McDarrah



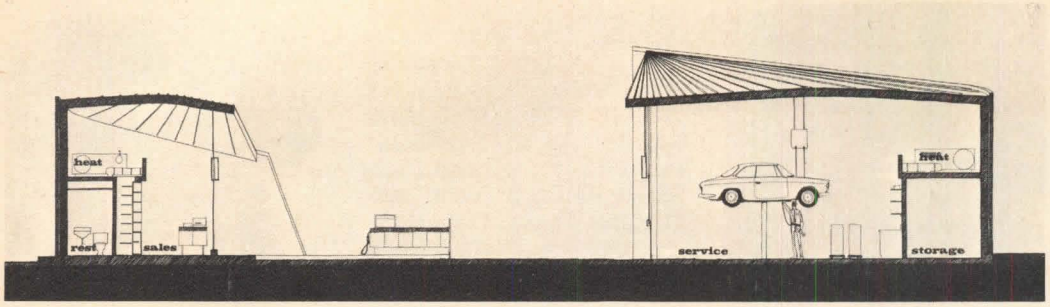
STUDENTS PROTEST SOM PROJECT IN SOUTH AFRICA

NEW YORK, N.Y. A group calling itself The Architects' Resistance demonstrated March 21 outside the New York offices of Skidmore, Owings & Merrill and the South African Consulate to protest SOM's Carlton Center project in Johannesburg.

Signs carried by the marchers claimed that they represented architectural students and faculty members from Pratt, Cooper Union, Columbia, Princeton, and Yale. In a protest notable for its peacefulness and orderliness, the noontime demonstrators swelled from about 30 to well over 100.

In its position paper, TAR stated: "One of the architectural profession's most prestigious firms, Skidmore, Owings & Merrill, is putting its skills, resources, and name behind the brutal racism of South Africa. . . . We, The Architects' Resistance, say that SOM's support of apartheid reveals them for what they — and most of the architectural profession — are: unprincipled practitioners of an art for its own sake and mainly for the sake of profit. The pursuit of profit and fame have lead SOM and most of the rest of the profession to build their monuments in reflection of their own egos — at the expense of those who must live with them."

The group demanded that SOM and Paul Weidlinger Associates (structural engineers) disassociate themselves from the project, that the AIA censure SOM and any other firms doing business in South Africa.



THE NECESSARY EVILS

The project: A Sunoco service station in Boston's Downtown Waterfront Urban Renewal Area. *The challenges:* Siting on a small triangular piece of land; maintaining corporate identity with the Sun Oil Co. without disrupting the neighborhood atmosphere of the surrounding old granite shipping warehouses and concrete mercantile buildings, all being converted to residential, office, and retail use; serving both the neighborhood street (Commercial) and a major thoroughfare (Atlantic Avenue) without connecting them; and keeping access open to the garage of an adjoining 11-story apartment building at the back of the plot.

The design, by J. Timothy Anderson & Associates Inc. of Boston, both meets the immediate challenges of the project and demonstrates how this necessary but often ugly service building can be successfully placed in urban areas. Advertising has been limited to two signs that face on-coming traffic and light much of the service area but lack the usual harshness of service station identification (see photos). Sales and customer convenience facilities are in two buildings, whose curvilinear forms are not those of the usual gas station, to say the least. The concrete roof of each building is formed by straight lines radiating from the high point of each brick garden-like wall and is waterproofed with a liquid membrane. The seams divert rain water to a channel at the top of the wall, which directs water along and down the canted face of the wall to a cistern. Construction on the $125,000 project — the cost includes site work and facilities — was begun last month, with completion slated by September.



On the Same Subject

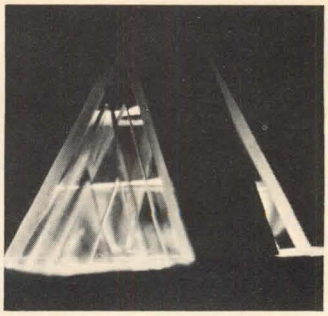
The subject of service station design was discussed in a recent issue of the magazine *Horizons,* published by Pan American Petroleum Corporation. According to R. A. (Bob) Niles, American Oil Company's manager of design and engineering, a rock-bottom count shows that a sound service station design requires 3025 separate decisions on such matters as whether restroom doors should be outside or inside, or whether service bay doors should be located at the front (inviting service) or at the rear (keeping the driveway clear).

Niles notes that design differences are part of a trend during the past few years to make stations look more like residential buildings. But, he predicts, "After four or five years, the design pendulum will swing back the other way. Stations will once again be basically uniform, with simple designs and clean, uncluttered lines. Economics again will dictate this."

He does not say, however, how this prediction might run counter to another of his forecasts — that the corner service station may become nearly extinct, with the stations moving "almost exclusively" to shopping centers and to other concentrations of business where the traffic count is high. If this prediction should be borne out, service station design would have to be an integrated element whenever a shopping center with a specific design motif is considered.

AWARDS

The AIA has announced winners of the **1969 Reynolds Aluminum Prize for Architectural Students.** The top prize of $5000, which is divided equally between student and school, went to Gerald D. Runkle, a senior at Ohio State University, for his design of a "soundfountain." . . . **The New York State Arts Council** 1969 awards program paid special tribute to the New York State University Construction Fund for its encouragement of excellent architecture in the units of the State University. . . . **The South Dakota Chapter AIA** has presented Honor Awards to Ralph S. Koch and Associates (branch bank design) and The Spitznagel Partners, Inc., (two designs, a bank and a church). . . . Winners of the **1969 Honor Awards Competition of the Michigan Society of Architects** are: William Kessler and Associates, Inc., of Bloomfield Hills (Timber Shores Travel Trailer Resort), Denis Charles Schmiedeke of Ypsilanti (private residence), Begrow and Brown Architects, Inc., of Bloomfield Hills (church), and Tarapata-MacMahon-Paulsen Associates, Inc., of Bloomfield Hills (two college structures).



Model of Stoyanoff's design.

ARCHITECT'S SUIT TO TEST POWERS OF REVIEW BOARD

ST. LOUIS, MO. Architect Dimiter Stoyanoff has filed a suit in St. Louis County Circuit Court that could test the powers of local architectural review boards throughout Missouri. Specifically, Stoyanoff has sued for a writ of mandamus ordering the Ladue Architectural Board to permit him to build the home he designed for himself in the St. Louis suburb.

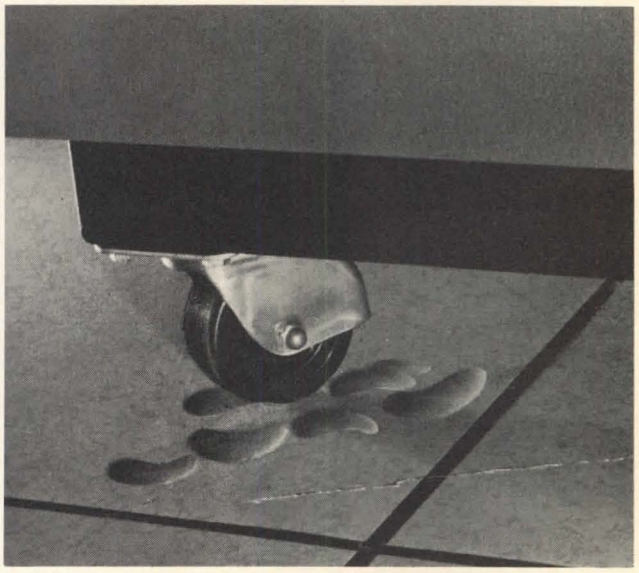
His suit contends that the Ladue ordinance setting up the board is invalid and illegal under Missouri laws that allow municipalities to establish and regulate local building codes. The three-man Ladue board admits that Stoyanoff's design meets the building code regulations but refused to approve his plans — and thus kept the city from issuing him a building permit — under its local powers to deny approval to a proposed structure that "is not in general harmony with the style and design of surrounding structures."

Stoyanoff's design calls for a pyramidal shape, with large areas of glass and cypress shingles or slate. The one-acre lot is set back from the road about 375', and the house would be screened from the road by a large Dutch Colonial house on the front part of what was a two-acre lot.

The official position of the AIA is that design review can be a powerful tool to insure quality, as long as it does not stifle creativity. A U.S. Supreme Court decision in 1954 affirmed the right of local government to extend its exercise of public power to aesthetic values. But several state courts have overruled local boards.

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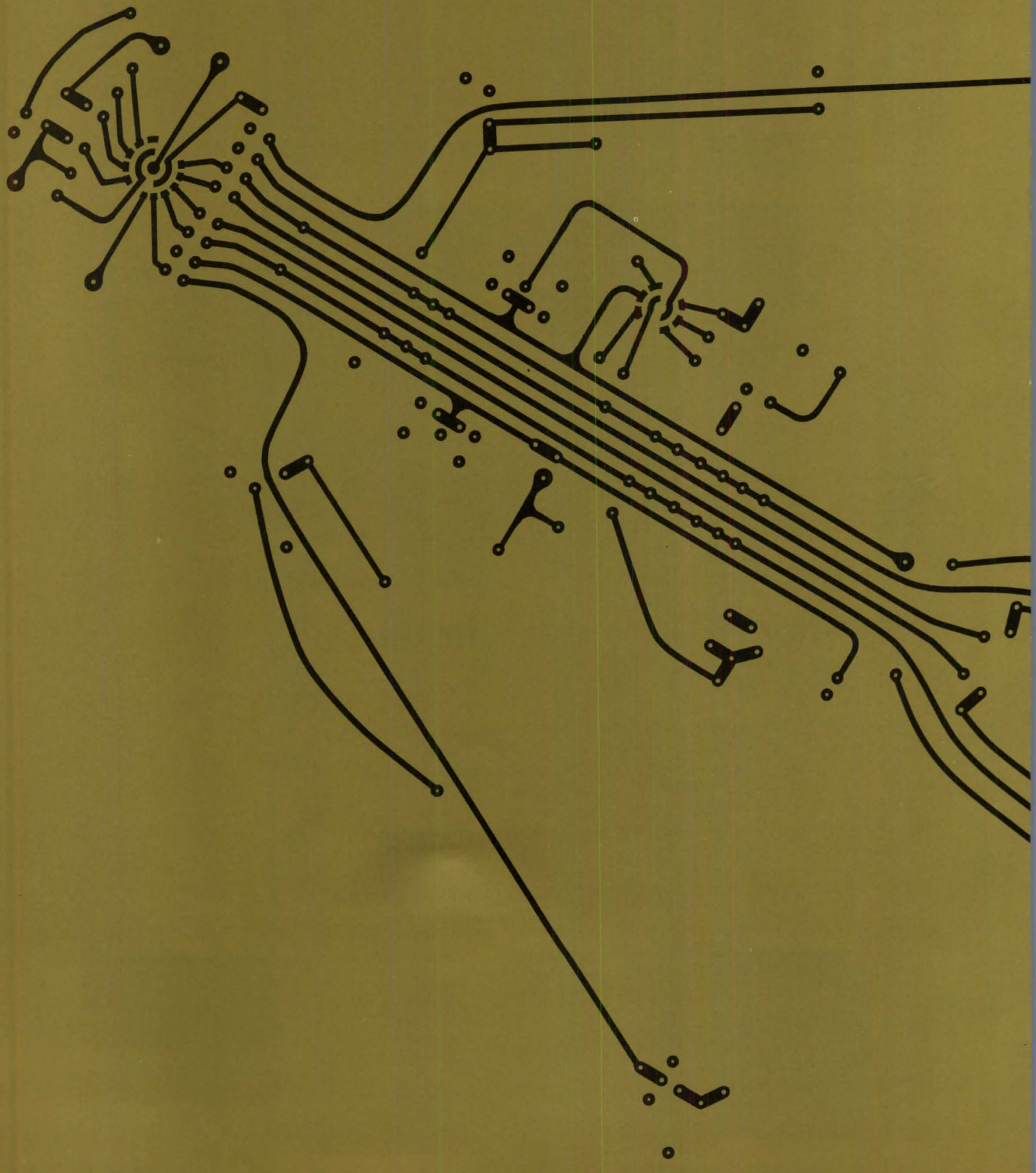
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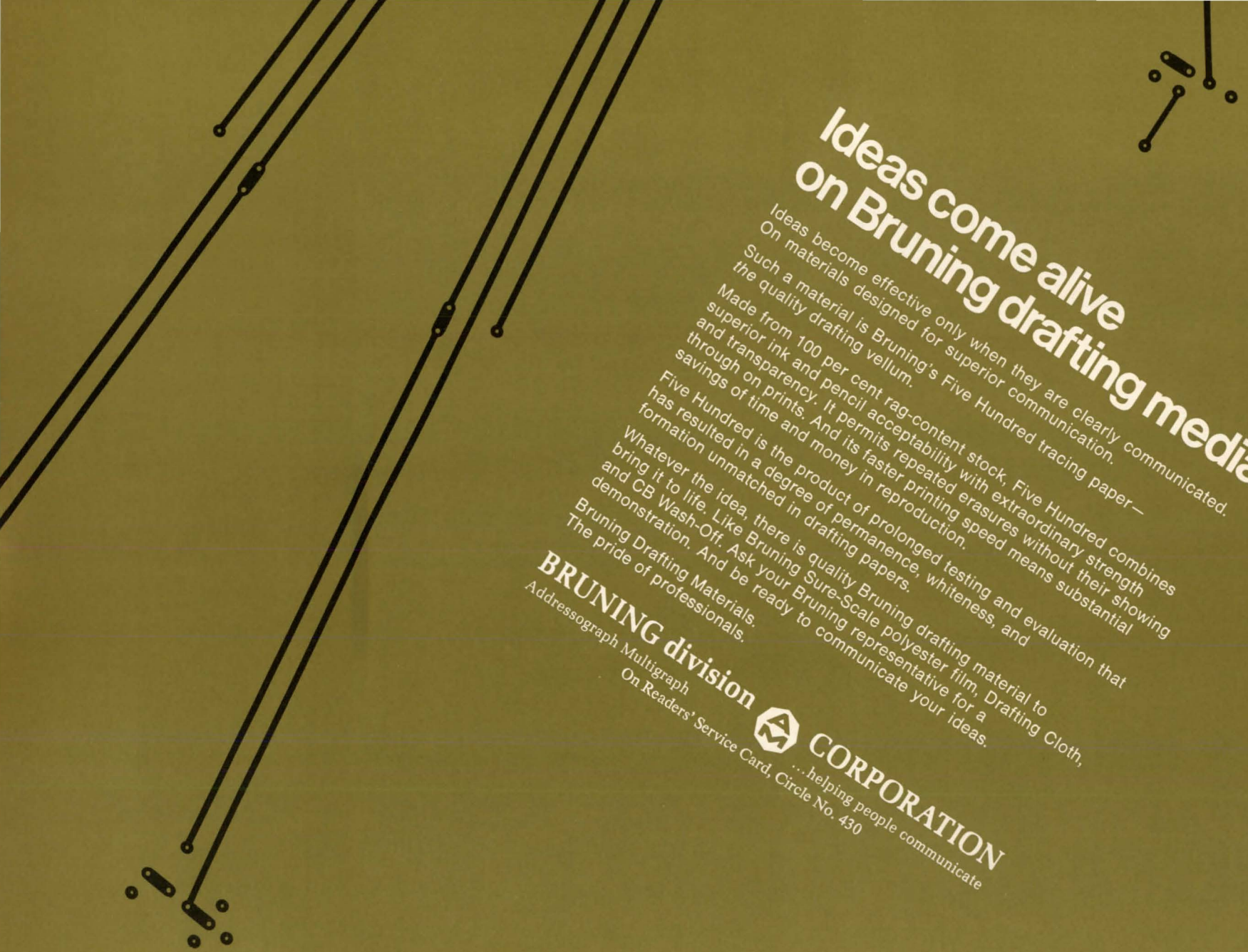
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On Readers' Service Card, Circle No. 430



Preliminary plan, left to right: recreation center, stores, hotel, high rise apartments, and offices.

PRECAST ESKIMO TOWN

FROBISHER BAY, CANADA. About 200 miles south of the Arctic Circle lies a scattered community of 1700 persons. Frobisher Bay, at the southern end of Baffin Island, was originally a trading post of the Hudson Bay Company; then, in 1942, the U.S. Government built an airstrip there to serve as a refueling stop for planes on the way to Europe. Both the airport and the American way of life that came with it provided a lure for Eskimos in the area, and many of them gave up their traditional means of providing for themselves — hunting and fishing — to work for the white man. When the air base was closed in 1963, since jets eliminated the need for a mid-Atlantic refueling, many of the Eskimos went on welfare.

Now the Canadian government hopes to bring the Eskimos the rest of the way into the 20th Century. It will build at Frobisher Bay the second new town in the Northwest Territories, providing housing (222 units), recreation facilities, a school, and perhaps even jobs for the people who live there.

The construction job will be a tough one. The only way to get to Frobisher Bay is by air, or by boat during the three months the harbor is free of ice. Even during the brief summer, permafrost is found a foot beneath the ground's surface. The developers plan to use a modular system of precast concrete units, manufactured and assembled on the site. By making the units modular, they plan to be able to add to the buildings horizontally and vertically if the need arises. Local rock is available as aggregate, and, during the winter, when construction is almost impossible, fabrication of the precast panels can be continued indoors. Local labor will handle both the manufacture and construction of the buildings, and then will maintain them, a task that, in Frobisher Bay's sub-Arctic climate, may be as demanding as the construction.

A consortium from Edmonton — Solar Construction Co. Ltd., Lockerbie-Hole (Western) Ltd., and Batoni-Humford — is handling the development under an arrangement with the government giving them a 20-year lease on the site. At the end of that period, the buildings, all of which are rental units, revert to the government.

The government will provide housing for Eskimos (on welfare) and for public servants by leasing apartments from the developer and subletting them to the occupants.

STUDY TO DEVELOP COURTROOM CRITERIA

A joint committee of the AIA and the American Bar Association will supervise a study to develop environmental facilities criteria for courtrooms and related activities. The study, to be conducted at the University of Michigan under a $197,000 grant from the Ford Foundation, will study the whole range of courts, from municipal to Federal. The two-year program is aimed at developing standards of physical environment designed for specific functions of various types of courts, including spatial arrangements, lighting and acoustics, and services performed by court personnel.

Architectural representatives on the committee will include Walter H. Sobel, serving as chairman from the AIA, Alexander Bacci, Richard Bennett, Daniel Brenner, Kenneth Folgers, and Ralph Youngren, all of Chicago.

PERSONALITIES

The New York Council, Society of American Architects, has elected the following officers: **Joseph P. Trapani,** president; **Benjamin Zlochhower,** vice president; **Nicholas D'Angelo,** secretary and treasurer. . . . AIA Urban Design and Development Corporation has named as trustees **John Fisher-Smith,** San Francisco, Calif.; **Jules Gregory,** Lambertville, N.J.; **Donald H. Lutes,** Springfield, Ore.; **George T. Rockrise,** San Francisco, Calif.; **Archibald C. Rogers,** Baltimore, Md.; and **Max O. Urbahn,** New York, N.Y. . . . **Charles Luckman,** Chairman of Charles Luckman Associates, Los Angeles, Calif., has been chosen by the American Academy of Achievement to receive the Golden Plate Award as one of the 50 cited for outstanding accomplishment. . . . **Gustave R. Keane,** partner in Eggers & Higgins, New York, N.Y., has been appointed to the national committee on administrative practice of AIA. . . . **Earl P. Fullingim** has been elected Alaska AIA executive director. . . . **H. Dickson McKenna** has been elected executive director of the New York State Association of Architects, Inc. . . . **Donald W. Hassenstab** has been elected executive director of the Minnesota Society of Architects. . . . Architects **Donald Q. Faragher,** Rochester, **Norman Wiedersum,** Valley Stream, **Milo D. Folley,** Syracuse, and **Henry L. Blatner,** Albany, have been named to the advisory committee of the Division of Educational Facilities Planning of the New York State Education Department. . . . The 1969 Milton J. Dyer Award in Architecture, given annually by the City of Cleveland, has been presented to **Peter van Dijk**. . . . The Regional Plan Association (New York, New Jersey, Connecticut) has elected **Morris D. Crawford** as chairman of its board. . . . The new Urban Affairs Center of the AIA will be headed by **Ralph Grayson Schwarz,** an executive of the Ford Foundation. . . . The following officers have been elected to serve the Society of American Registered Architects: President, **Roy D. Murphy,** FARA, Urbana, Ill. President-Elect, **Bernard Healy**, FARA, principal, Bernard Healy Assoc., Framingham, Mass.; Treasurer, **Herbert Berger**, FARA, principal, Development Design Assoc., Wichita, Kansas. . . . The National Institute for Architectural Education has announced new officers for 1969. They are: Chairman, **Caleb Hornbostel,** AIA; Vice Chairman, **Arnold A. Arbeit**, AIA; Secretary, **Joseph Roberto,** AIA; Treasurer, **Baldur Peter,** AIA; Director of Education, **Sidney Katz,** FAIA; and Committee Chairman on Architecture and Scholarships, **Harvey Clarkson,** FAIA. . . .**Taylor Culver** of Howard University, Washington, D.C., was elected president of the Association of Student Chapters/AIA.

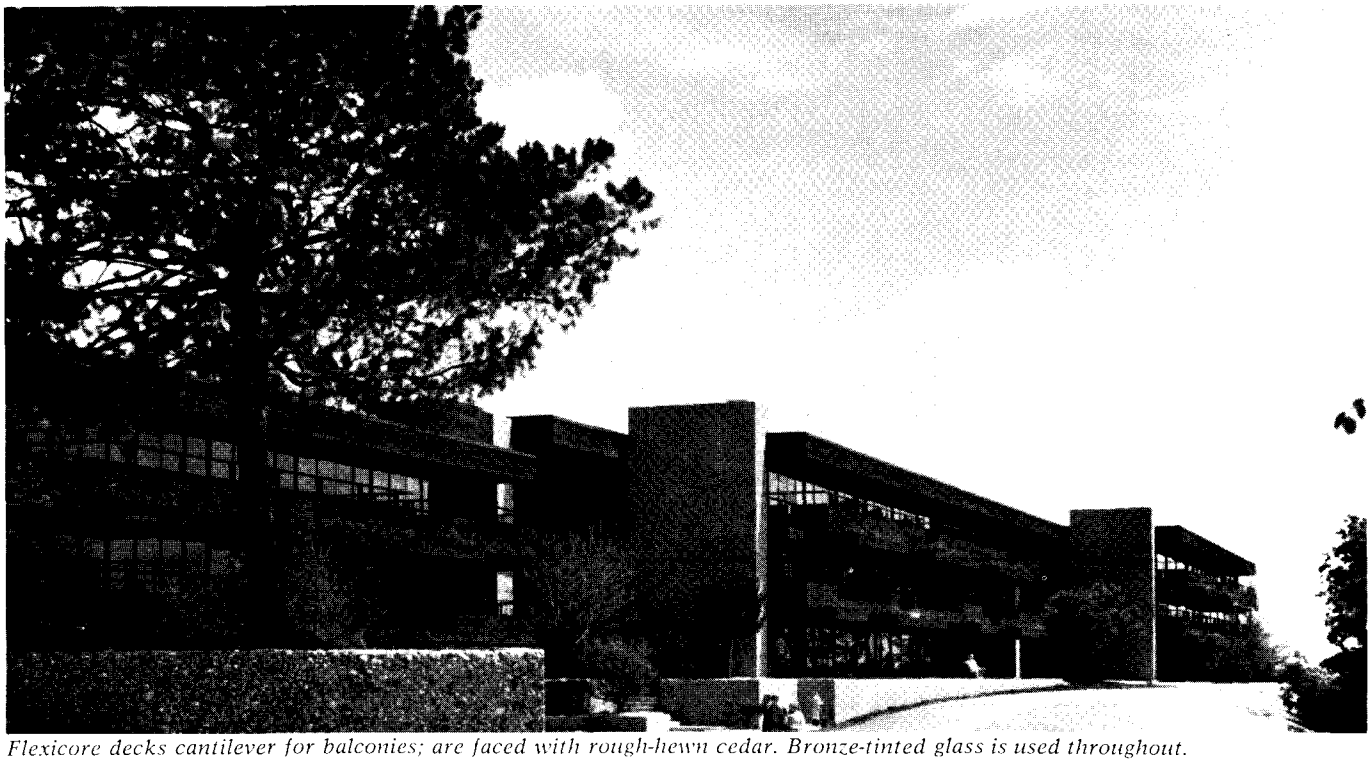
KEEPING THE VIEW PUBLIC

BUENOS AIRES, ARGENTINA TAC has designed a new residence for the German ambassador that capitalizes on a unique site — a large public park in the middle of the city. The TAC proposal would maintain maximum visibility for pedestrians in the park by depressing the first floor and raising the second story to tree-top level. Plantings atop the first floor would continue the sylvan feeling of the park.

The first floor will contain reception rooms, a large hall, music salon, library, and a dining room, all to be built around a sunken covered courtyard. Apartments will be on the second floor.

Walter Gropius is TAC partner-in-charge; design was done in association with Buenos Aires architect Amancio Williams. Construction is expected to start this year.





Flexicore decks cantilever for balconies; are faced with rough-hewn cedar. Bronze-tinted glass is used throughout.

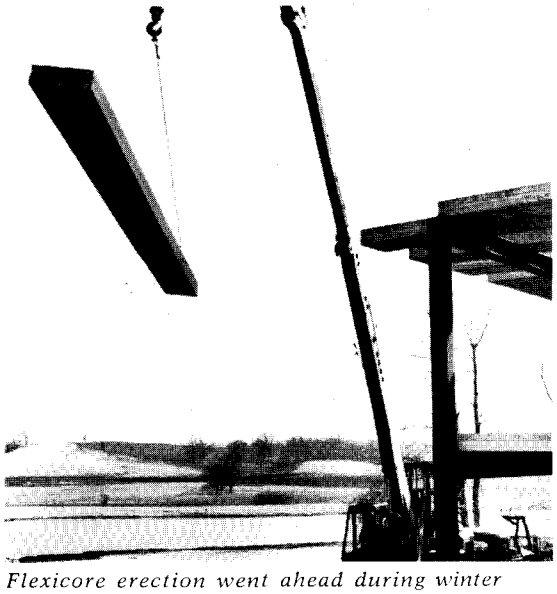
New Playboy Club-Hotel has 200,000 sq. ft. of Flexicore deck in six guest wings

The beautiful new Playboy Club-Hotel at Lake Geneva, Wis. is a year-round resort and convention center.

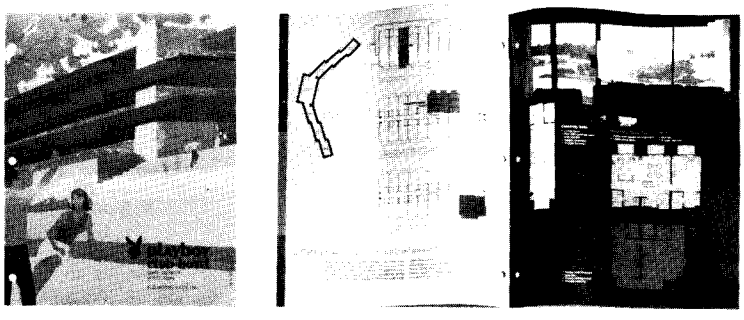
Its 300 rooms include a variety of special accommodations including the Hugh M. Hefner penthouse, large enough for 250 party guests.

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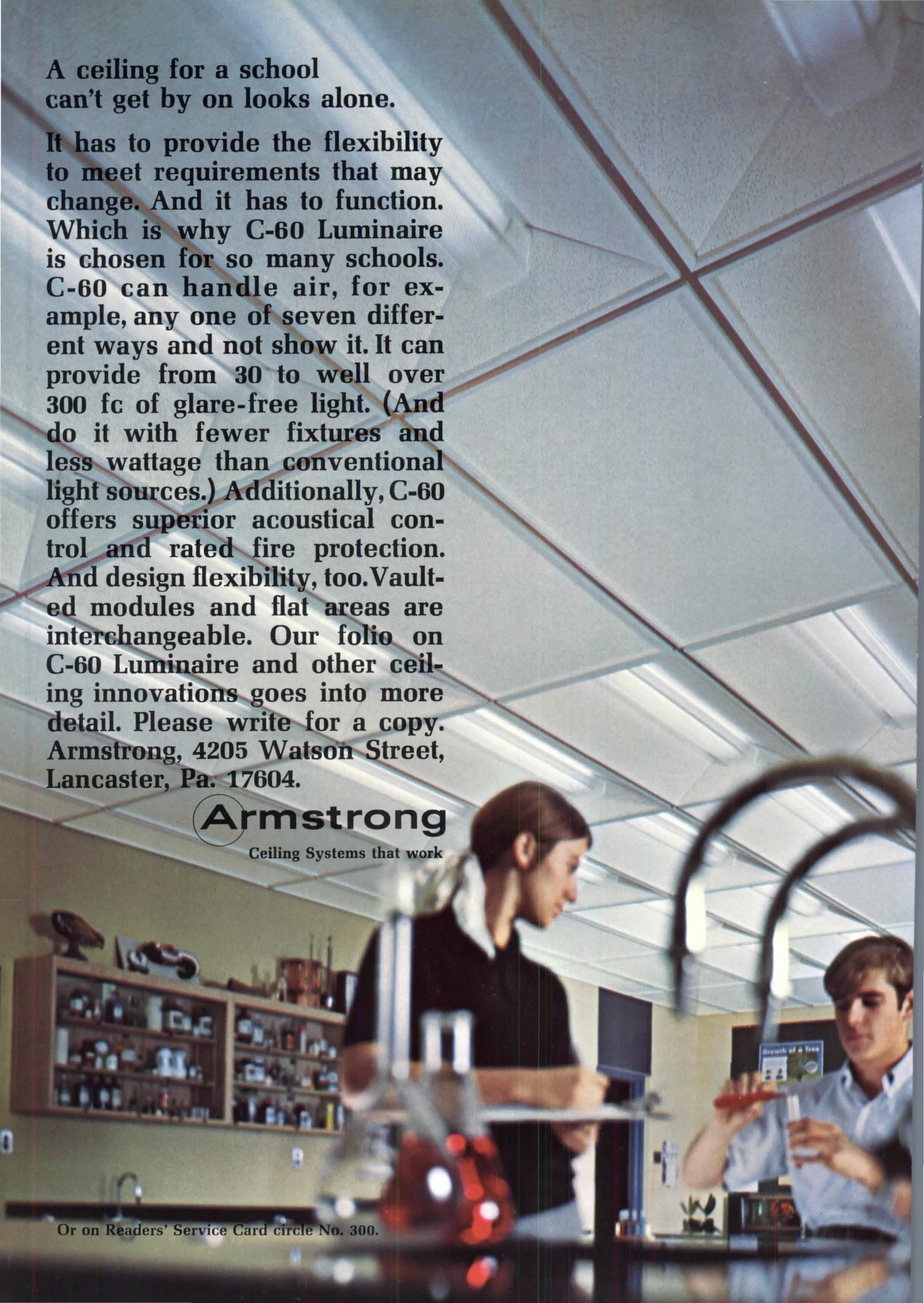


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Daffodil Valley Elementary School, designed by Donald F. Burr & Associates of Tacoma, Wash., was cited for its open learning areas.

SCHOOL DESIGNS CITED

ATLANTIC CITY, N.J. Special citations were awarded to 29 school designs entered in the Exhibition of School Architecture at the annual conference of the American Association of School Administrators, Feb. 15–19. Although no awards were given, the jurors' citations were granted to call attention to certain features they considered outstanding among the 233 entries.

Firms cited for elementary school features were: Aitken & Collin & Associates, Berkeley, Calif.; Arendt, Mosher & Grant, Santa Barbara, Calif.; Donald F. Burr & Associates, Tacoma, Wash.; Chapman & Miller, Washington, D.C.; Norman M. Giller & Associates, Miami Beach, Fla.; Greenleaf & Telesca, Miami, Fla.; Lane, Reibe & Weiland, Ann Arbor, Mich.; Maiwurm & Wiegman, Fort Dodge, Iowa; Edward H. Marble & Associates, Yakima, Wash.; McLeod, Ferrara & Ensign, Washington, D.C., (two designs cited); Parks, Morin, Hall, Brennan & Sattleberg, Rochester, N.Y.; Richard Prince & Associates, Kalamazoo, Mich.; Smeallie, Orrick & Janka, Baltimore, and Stevens, Bertin & O'Connell, Rochester, N.Y.

Listed for middle-level or junior high schools were: Falcone & Salk, Cranston, R.I.; Morris Hall & Peter Norris, Atlanta, Ga.; Johannes & Murray & Associates, Silver Spring, Md.; Kellam & Foley, Columbus, Ohio, and A.G. Paletta, Long Island City, N.Y.

Cited for senior high school designs were: J. Prentiss Browne, Baltimore, Md.; The Cerny Associates, Minneapolis, Minn.; Walter P. Crabtree, Jr., West Hartford, Conn.; Eckert & Carlson, Winona, Minn., and Hueppelsheuser Associates, Fort Worth, Tex.

Cited for designs in the special education or college categories were: J. Herschel Fisher & Pat Y. Spillman, Dallas, Tex.; Hunter, Heiges & Associates, Sharon, Pa.; Locke, Smith & Wright, Oklahoma City; and Adrian Wilson Associates and Ellerback, Koteles, Fox & Associates, Newport Beach, Calif.

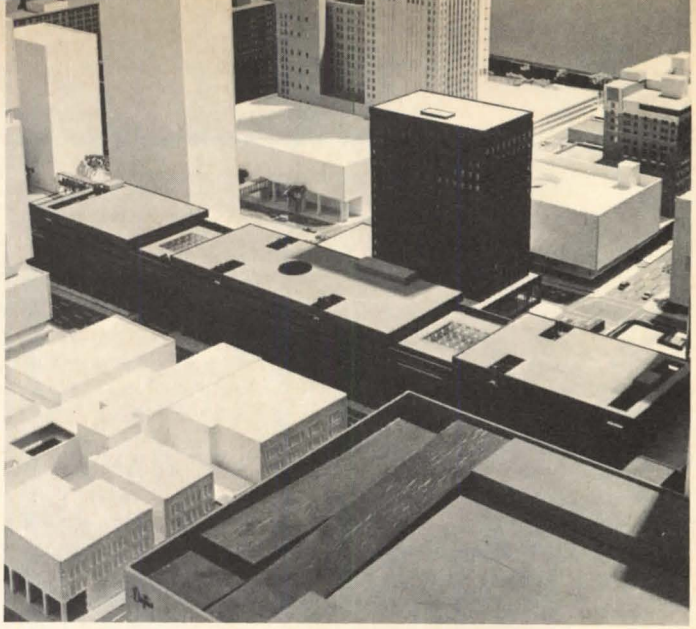
Architects on the jury were Ralph H. Burkhard, Seattle, Wash.; Spencer B. Cone, Chicago, Ill.; Lester C. Haeckel, St. Louis, Mo., and Bruce H. Smith, Royal Oak, Mich.

OBITUARIES

NEW YORK, N.Y. Ben Shahn, one of America's most popular artists and a champion of liberal causes throughout his long career, died on March 14 at the age of 70.

Shahn first found his means of "social communication," as he called it, in 23 small gouaches and two large panels painted during the Sacco and Vanzetti trial and execution that depicted the two men as martyred innocents. From that time on, to posters done for last year's Presidential campaign of Senator Eugene McCarthy, he was to continue focusing his basically realistic style — on canvas, in murals, in commercial art — on a social-surrealistic portrayal of movements and events of his time.

Criticized in recent years for putting too much sentiment into his work and for being out of step with the abstract modes of the times, Shahn summed up his philosophy with the reply: "Is there nothing to weep about in this world any more? Is all our pity and anger to be reduced to a few tastefully arranged lines or petulant squirts from a tube held over a canvas?"



SKYWAY BUILDING UNDERWAY

SAINT PAUL, MINN. Construction has begun on the $6,500,000 Skyway Building, a three-block-long omnibuilding that bridges two streets and forms the symbolic core of the 12-block Saint Paul Downtown Renewal Project (see AUGUST 1967 P/A).

The five-story structure, owned by the L. J. Sheridan Company of Chicago and the Northern Centre Corporation of Saint Paul, was designed by Grover Dimond Associates Inc. It contains 100,000 sq ft of commercial space and parking space for 1200 cars. Plans call for more floors to be added later.

The building contains a major portion of the air-conditioned upper level pedestrian concourse system interconnected to six adjacent blocks by bridges, a feature especially suited to the area's long, cold winters.

The building will be enclosed with metal curtain walls and screens to harmonize with the adjacent 16-story headquarters building of the Northwestern National Bank of Saint Paul (dark building in photo).

BOSTON CENTER CURVES

BOSTON, MASS. With the completion of the exterior of its third and final section, Central Plaza Office Building, dubbed "Boston's first horizontal skyscraper" by its press agents, can now be viewed in its 900′ entirety. Designed by Welton Becket & Associates, the eight-story building is to be ready for occupancy by August.

Part of the Boston Government Center, the structure curves along Cambridge and Tremont Streets across the plaza from the new City Hall (the photo, which was taken from above City Hall, shows the top of that building in the foreground). It can provide up to 75,000 sq ft of continuous office space on any one floor, and is designed to integrate offices with areas for parking, retail shops and services, and public lobbies.

Textured precast concrete window frames are set between panels of red brick to form the exterior skin of the steel-frame structure. A pedestrian arcade leading from Cambridge Street to Pemberton Square is connected by a giant staircase to another arcade on the mezzanine level. Terrazzo flooring and marble, granite, and natural stone walls are used with coordinated fixtures throughout the public areas.



WASHINGTON/FINANCIAL NEWS

by E. E. HALMOS, JR.

Facing Construction Costs — Finally coming to grips with the nation's financial situation — as Presidential messages concerning the budget, taxes, and the like began to move down Pennsylvania Avenue toward the Capitol — Congress was showing real concern over construction costs.

The concern was on two levels: first, cost of building materials; second, costs of labor and labor's control over the use of materials.

In both cases, center of action was the stalled housing program that had been announced with such fanfare by the Johnson Administration more than a year ago but is still resting virtually on dead center.

Housing and Urban Development Secretary George Romney was a lead-off witness before Senate committees, and he wasted no time in arguing that the previous Administration had set its sights entirely too high (225,000 low-cost units, which, Romney said, was too high by at least 50,000 units) and thus had touched off speculation in building materials. Romney also charged that current profits on lumber "have gone beyond what could reasonably be expected in relation to equity investment." He added that there is a lack of adequate competition in the lumber industry and that the only remedy he could see would be to encourage a greater timber harvest, including Alaskan timber and material on Government-owned lands. (In this, incidentally, he seemed to be lending credence to Interior Secretary Walter Hickel's much-criticized remark about "conservation for conservation's sake," which he later explained to mean allowing timber to rot on the ground, for example, rather than prudently harvesting it.)

There were some other solutions offered immediately: The 9000-member Associated General Contractors, which was holding its fiftieth annual meeting while Romney was testifying, suggested the formation of a "trust fund" (to be financed by proceeds of sale of government timber) that could be used to construct access roads in the Federal forests and to accelerate better management programs in these forests.

And some 500 architects and engineers, also meeting in Washington for a joint AIA-CEC legislative conference, heard Romney's Undersecretary, Richard C. Van Dusen, suggest that "prefabricated building materials" might produce "interesting, livable" neighborhoods and might spark the necessary housing boom.

But Congress is becoming increasingly aware that labor unions have already succeeded in slowing or halting the use of prefabricated materials on many construction jobs, and that they are exercising virtual veto power over contractors, architects, and engineers as to what materials and what methods may be used. (The labor hand was strengthened by the Supreme Court's "Philadelphia Door" decision nearly two years ago, which permitted a union to block the use of some 3000 pre-hung doors in an apartment project; see JUNE 1968 P/A).

To end this threat, Congress now has before it a bill (S.1532) sponsored by Florida's freshman Senator Edward J. Gurney that would prohibit unions from boycotting any prefabricated building components; another bill in the House that would amend the long-standing Norris-LaGuardia Act, and give employers injunctive relief against unions that break "no strike" contract pledges.

(Construction labor had its own fish on the fire, of course: most notably, a "package" of four Senate bills — S.1368 to S.1371 — that would permit "common situs" picketing, employer contributions to joint product promotion funds, Federal promulgation of safety regulations, and would allow joint groups to "interpret" collective bargaining agreement clauses.)

A final point on construction costs — particularly in housing — that was worrying Congress and the Administration was the ever-upward trend of financing costs, with interest rates on mortgages now reaching near 8% in many places. Such rates are pushing the costs of buying a "low-cost" home out of the range of many moderate-income families. The only answer seems to be the now-concerted Administration effort (through taxes and attempts to attain a balanced budget) to hold back the long-running U.S. inflationary trend.

On Other Fronts — There were some other moves — in and out of the Government — to get the housing sector moving:

President Nixon announced a reorganization of regional HUD offices to simplify procedures in dealing with urban problems.

The AIA announced formation of an Urban Design and Development Corporation, which will suggest means by which architects can "advance new forms of transportation, the renewal of older cities, design of new communities."

A new version of the Federal Fine Arts and Architecture Act (S. 1457) was introduced, to "foster high standards of architectural excellence in the design and decoration of Federal public buildings and post offices."

The Department of Transportation took the lead for all Federal departments in attempting to ease the many complaints about administration of "equal employment opportunity" regulations: DOT said it would now include the requirements in all contracts of $10,000 or more, thus making them a condition of the bid, rather than subjects for post-bid or pre-bid negotiation.

While these attempts to get a handle on rising costs were going on, Congress was also considering two measures that would add yet more money to the construction pot:

S. 1589, which would set up an additional $100 million fund for hospitals for "emergency" construction (in addition to Hill-Burton funds already available).

S. 1265 (and companion House bills), which would set up the predicted trust fund to finance a steady program of airport and airways construction work.

Finally, the Douglas Commission held a Washington press briefing to present its second annual report on what should be done about modernizing housing codes — to permit use of new materials and methods of construction — and to bewail lack of progress on producing low-cost housing since its first report. One reason for that lack of progress, according to HUD Secretary Romney: No plans had ever been made by HUD, when he took over in January, to implement President Johnson's housing plans.

FINANCIAL

■ The Administration seemed to be sending up some contradictory trial balloons, as March ended, with regard to its future actions on construction spending: DOT Secretary John Volpe and other Cabinet members were on record as saying there would be no more "start-and-stop" construction financing; but Budget Bureau officials were hinting that some cutback in Federal construction spending might be in the cards. Most Washington insiders felt any such cutback would be relatively slight, but they were aware that such expenditures represent almost the only point at which the President can attack spending and show any immediate results.

■ Meanwhile, the construction economy seemed to be booming. Housing starts for February were set at a seasonally adjusted annual rate of 1.7 million, down from January but up substantially over a year ago; over-all value of new construction put in place in January, said the Census Bureau, was at an annual rate of $89 billion, well over the December rate of $84 billion and higher than 1968.

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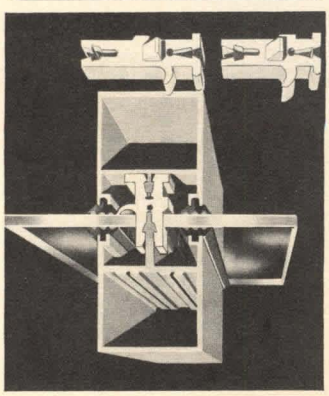
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DOORS/WINDOWS



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Circle 104, Readers' Service Card

FINISHES PROTECTORS

Non-slip abrasive. Abrasive compound that can be applied to floors by a paint brush creates a rough surface that prevents slipping. Manufacturer claims compound is resistant to most cleaners. Six color variations are available. Expoxo Chemical Division, Falcon Safety Products Inc., 205 Stern Ave., Springfield, N.J. 17081.
Circle 105, Readers' Service Card

FLOORING

Raised Floor Tile. Special laminated tile flooring for use in computer rooms available in 24″ x 24″ x 1.8″ tiles. Said to be durable and nonwarping; in four light-colored patterns. Enjay/Nevamar, Odenton, Md. 21113.
Circle 106, Readers' Service Card



Underfoot patterns. Manufacturer offers variety of carpets with dense, level-loop construction in 12′ widths for commercial use. Available are screen printed patterns on fine, gage-tufted base fabric with 100% Dupont continuous filament nylon pile and olifin primary back with high density rubber secondary backing. World Carpets, Dalton, Ga.
Circle 107, Readers' Service Card

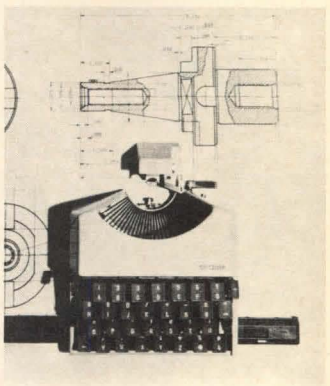
FURNISHINGS

Dynamic chair. A series of tables and chairs, said to permit flexibility in arrangement, are steel framed and have vinyl-rubber cushions that are available in several colors. They can be joined and locked by a "hidden" lock system. Lightness and lock-step feature permit arrangement of chair-lounge-table set in almost any pattern. Techfab, Division of Alsco, Inc., 4321 Semple Ave., St. Louis, Mo. 63120.
Circle 108, Readers' Service Card

LIGHTING

Glowing patterns. "Trimplex Luminous Ceiling" fixtures produce soft light terminating in glowing circles. Clear acrylic tubes create different levels of light patterns and unusual reflections. Styles consist of 2′ x 4′ standard module ceiling panels with 12 acrylic tubes of various lengths up to 12″, randomly set in a black acrylic sheet designed to fit standard T-Bar tile grids. Other styles may be suspended from ceiling or used as wall fixtures. Special orders available. Trimble House, 3832 Green Industrial Way, Atlanta, Ga. 30005.
Circle 109, Readers' Service Card

OFFICE EQUIPMENT



Automatic lettering. "Gritzner Lettering Typewriter" enables draftsmen, designers, or architects to letter on the average twice as fast as by hand, 3.5 times faster than stencil. The machine moves over the surface of the drawing and is positioned by a standard drafting machine — indexing rail fits into chuck in place of horizontal scale— or independently by its own indexing rail. The user then types with one finger the required dimensions, lists of materials or legend as the unit automatically moves ahead with each character struck. Indicator shows exact positioning of next character to be printed — an aid for inserts, change dimensions, etc. Manufactured by G.M. Pfaff AG, West Germany. Eastern distributor: Gritzner Graphics, 3127 Colvin St., Alexandria, Va. Distributor west of Miss.: Milmanco Corp., 620 S. 7th St., Renton, Wash. 98055.
Circle 110, Readers' Service Card

ROOFING

Built-up roofing. A system of built-up roofing requires only two plys for the average 20-year assembly. Easily installed, it requires half the labor operations and labor costs. Specially processed coated ply sheet makes it tough without loss of workability. Factory coating of mineral-stabilized asphalt elimi-

nates absorption of surface moisture damage. The "Dual 80 Ply Sheet" is less vulnerable to weather and physical damage, reduces amount of mopping-asphalt needed and carries a Class A fire-retardant rating. Building Materials Div., Products Corp., 120 E. Lancaster Ave., Ardmore, Pa. 19003.
Circle 111, Readers' Service Card

SANITATION PLUMBING



Have a heart. A heart-shaped marble bathtub is available in a wide range of colors. Though made with a molding process, it is said to look and feel like quarried marble and is four times stronger, highly heat-, stain-, and impact-resistant. A vanity top is also available with a heart-shaped basin to match. Venetian International, Inc., Expressway Tower, Dallas, Tex.
Circle 112, Readers' Service Card

The hydromassage is a recently added accessory to the manufacturer's Roman Bath line of custom bathtubs. In addition to the built-in Whirlpool, this glass fiber (said to be warm to the touch) bathtub features a contoured back, safety features, and is claimed to give 40% more body room within the tub. Both 5′ and 6′ models are available, in all decorator colors. Pump operations for the Whirlpool may be installed in a nearby cabinet or closet. Two recessed Whirlpool inlets are said to be the source of a "simultaneous all-over hydromassage." Jacuzzi Research Inc., 1440 San Pablo Ave., Berkeley, Calif. 94702.
Circle 113, Readers' Service Card

SERVICES



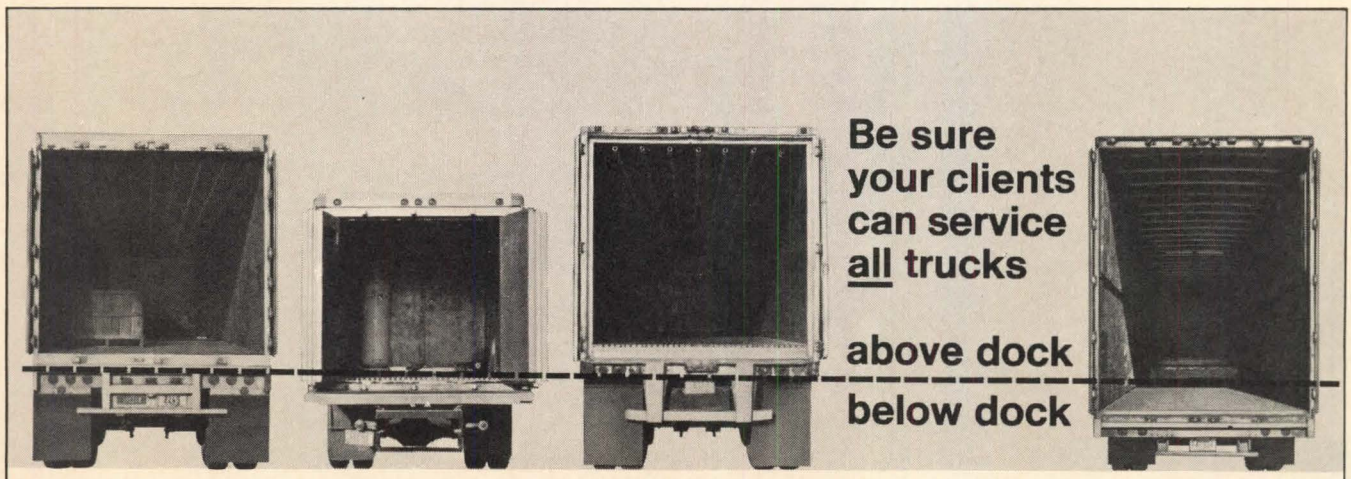
Contours. Three-dimensional, highly detailed, contoured scale models of land masses are manufactured from rigid urethane foam. Contours are accurately produced to any horizontal or vertical scale and size. They can be painted, epoxy coated, flocked, or left in "as cut" condition. Contours, Inc., Subsidiary Vedo, Inc., 15 Research Dr., Ann Arbor, Mich. 48103.
Circle 114, Readers' Service Card

SPECIAL EQUIPMENT

Unconventional lock. Push-buttons add to home safety with the introduction of a push-button lock assembly. The use of five buttons to unlock the mechanism is designed to hamper burglars, yet provide easy service for the owner. The cast-iron lock is fully automatic and can be easily installed and changed by the user. Simplex Lock Corp., 150 Broadway, New York, N.Y. 10038.
Circle 115, Readers' Service Card

SURFACING

Casting a lightweight panel. The Cameo-Cast line of precast concrete and cast stone building products includes exposed aggregate concrete panels and precast custom-designed products. An 8″ x 8″ x 16″ exposed aggregate face block is also offered with companion units. All have a variety of aggregate textures, finishes, and colors. The concrete matrix may be white or shaded; a copolymer matrix for lightweight panels is also available in many background colors. Acme Brick Co., P.O. Box 425, Fort Worth, Tex.
Circle 116, Readers' Service Card



Specify Kelley permanent dockboards

Kelley Permanent Adjustable Dockboards easily accommodate trucks with bed heights from 36″ to 60″ above ground. Effectively link trucks and docks to provide smooth, efficient, safe loading and unloading under all conditions.

Kelley Dockboards give you access to the full width of trucks; have sufficient length for proper incline; won't slip or slide; handle even the heaviest load; are always in place, ready to use.

Write or phone today for complete information. Ask for your copy of Modern Dock Design. It's the most authoritative source available on dock design. KELLEY COMPANY, INC., 6740 North Teutonia Avenue, Milwaukee, Wisconsin 53209, Phone: 414-352-1000.

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On Readers' Service Card, Circle No. 389


Esplanade
. . . an exciting combination of white Dacron® mesh, saddle-stitched to white or cordovan Corfam® on a corrosion-resistant, welded aluminum frame.
Esplanade . . . the all-weather collection, including the club chair shown, rocking loafer, adjustable chaise, sand chair, stacking chair, custom-patterned fiberglass-topped dining and occasional tables . . . each with an especially-designed base which won't sink in sand or turf . . . and in a wide selection of frame finishes.
Esplanade . . . designed specifically for the contract market . . . country clubs, resorts, pools, cabanas, solariums . . . and those more imaginative interiors. Esplanade . . . by Troy Furniture, The Troy Sunshade Company, division of The Hobart Manufacturing Company, Troy, Ohio 45373.
Designed by Herbert C. Saiger A.I.D.
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HEUGATILE LOOSE-LAID CARPET SQUARES... TOTALLY NEW CONCEPT IN CONTRACT CARPETING!

Revolutionary new Heugatile carpet squares are loose-laid... remain securely in place without adhesive, tack-strip, or underpad. Thus, long-wearing Heugatile carpet squares can be rotated—as required—to equalize wear, retard the development of wear patterns, and keep the entire carpet young-looking longer. Heugatile... the world's only totally-interchangeable, "rotatable" carpet squares.



At Fairfax Elementary School in Cincinnati...

Heugatile loose-laid carpet squares replaced vinyl asbestos tile. Vinyl tile was cold, noisy, dangerously slippery, and costly to maintain (required sweeping, mopping, waxing, and buffing!). But Heugatile solves these problems. And more...

- Long-wearing Heugatile carpet squares can be rotated to extend the life of the carpet.
- Most stains are easily washed off with warm water and mild detergent.
- *And,* Heugatile drives maintenance costs down! A recent test installation of 108 square yards in a busy school hallway reduced maintenance time from 12 hours per week (vinyl tile) to 2 hours per week (Heugatile carpet squares)—a saving of $29.75 per week *in the test area alone!*
- Heugafelt—one of four Heugatile carpet-square products — shrugs off cigarette burns without a trace of scorch.

Mr. Harold Theiss, Principal of Fairfax Elementary School, now agrees that Heugatile is "The Problem Solver." Even the name is tough. Heugatile. ("You-Ga-Tile").

See Heugatile "specs" in Sweet's 1969 A. & I.D. Files.

Tell the Problem Solver your floor-covering problem!

In 100 words or less, describe a floor-covering problem that could not be solved by ordinary carpeting. If selected to be featured in future advertising, the area described will be carpeted with Heugatile free of charge. Address: The Problem Solver, Van Heugten U.S.A. Inc., 185 Sumner Ave., Kenilworth, N.J. 07033.

Heugatile carpet squares are unconditionally guaranteed to remain in place. Will not shift under foot, wheel, vacuum or cleaning machinery when installed according to manufacturer's recommendations.

HEUGATILE® *The problem solver*

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Van Heugten Canada Ltd., 107 Orfus Rd., Toronto 19, Ontario, Canada • (416) 789-7546

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FAMILY SPA an entirely new dimension in luxury, pleasure and health. Big enough for the entire family.

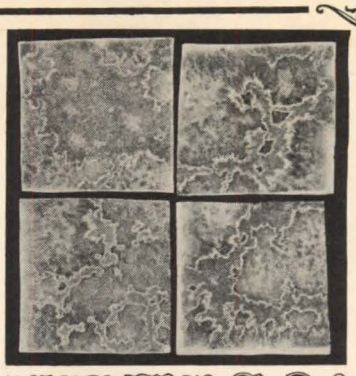
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shades of old Venice



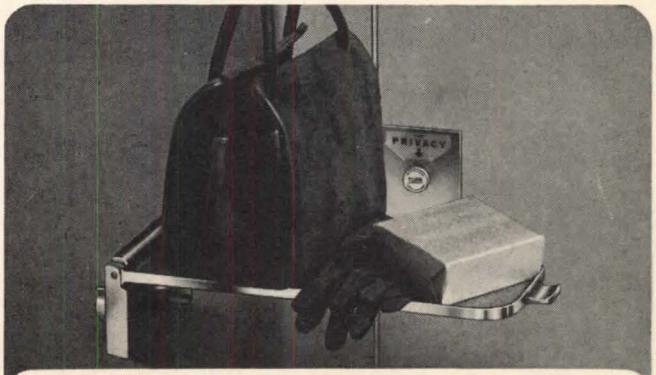
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Lavish shades, subtly depicting the glory of Renaissance Venice, have inspired Latco's "Venezico" collection.
Vitreous, hand-crafted tiles in 20 decorator colors, including gold, silver and brass.
Designed for interior and exterior application, it weathers all seasons and time itself!
Mesh mounted on 12″ x 12″ sheets with complete trimmers, for easy installation at low cost. For further information, write to:

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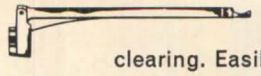
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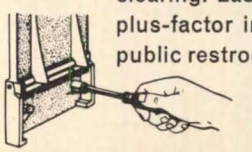




NEW... a handy PULLDOWN SHELF

for restroom booths





A safe place for purses, gloves, packages, hats, coats and briefcases. Sturdily built of Zamac. Attractive chrome and satin stipple finish. Self-clearing. Easily installed with just 2 bolts. A plus-factor in any building you design with public restroom facilities. Send for free specifications, price lists and installation instructions.

The NIK-O-LOK Company 422 E. New York Street Indianapolis, Ind. 46202

On Readers' Service Card, Circle No. 370

MFRS' DATA

AIR/TEMPERATURE

Cool brochure. Brochure describes problems and potential of packaged cooling tower. Heavy-gage galvanized steel units are fully described in diagrams that explain capacities and dimensions. 8 pages. Havens Cooling Tower. 7219 E. 17th St., Kansas City, Mo. 64126.
Circle 200, Readers' Service Card

Heating, cooling, and dehumidification, simultaneously. Climate Master self-contained, water-cooled heating and cooling units have a removable air-conditioning chasis as well as a hot-water heating coil. Neither a fan-coil nor a thru-the-wall unit, the Climate-Master one-pipe system can both heat and cool at the same time, according to individual thermostat demands. For example, side-by-side rooms in the same apartment can get different heating and cooling. The unit operates on a heat-recovery principle, and in addition offers controlled dehumidification. Data includes schematics, installation process, performance curves, and a component and piping diagram. Specs. Cool-Heat Corp., 121-18 DuPont St., Plainview, N.Y. 11803.
Circle 201, Readers' Service Card

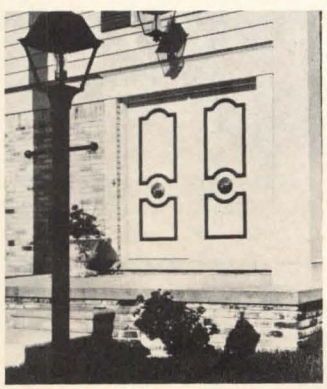
CONSTRUCTION

Pole data. Catalogue describes uses of timber poles in construction. It explains design theory and illustrates numerous typical designs. 48 pages. American Wood Preservers Institute, 2600 Virginia Ave., N.W., Washington, D.C. 20037.
Circle 202, Readers' Service Card

Aluminum extrusions. A new technical book, titled "Aluminum Extrusions in Architecture," details uses of extruded aluminum shapes. Advantages of architectural application, basic factors of practical use, and numerous combinations of function and appearance are illustrated and described in 250 line drawings and photos. Typical commercial applications are shown. Chapters also cover versatility, surface finish and color, design principles and assembly methods, supplementary building components, and more. Pertinent tables and appendices of formulae derivations are also included. Copies may be obtained by making request on company letterhead, including name and title. Illus. Book: 162 pages. Write to Technical Publications Dept., Kaiser Aluminum & Chemical Corp., 300 Lakeside Drive, Oakland, Calif. 94604.

Steel abstracts. Summaries of articles on design of steel structures in a booklet titled "Steel Abstracts for Construction," contains synopses of 56 recent significant technical articles by 22 U.S. and foreign publishers. Topics covered include examples of progressive design and research; new methods of analysis, design, and construction; uses of new types of structural or plate steel products; buildings, bridges, and water storage and transmission. 22 pages. American Iron and Steel Institute, 150 E. 42nd St., New York, N.Y. 10017.
Circle 203, Readers' Service Card

DOORS/WINDOWS



Sandwich doors. Decorator steel doors with polyurethane insulation are available in 30 styles. Catalogue illustrates construction, styles, and available sizes. Brief specifications. 8 pages. The Stanley Works, New Britain, Conn. 06050.
Circle 204, Readers' Service Card

FINISHES PROTECTORS

Aluminum finish. Contemporary aluminum finishing techniques are described in a new manual, "Architectural Finishes for Aluminum." Chemical, mechanical, anodic and "Duranodic" finishes, and applied coatings are discussed. Line drawings show processes and recommendations for anodic and porcelain enamel finishes. A broadly defined catalog of textures and coatings completes the manual. Available by letterhead request. 68 pages. Aluminum Co. of America, 640 Alcoa Bldg., Pittsburgh, Pa. 15219.

FLOORING



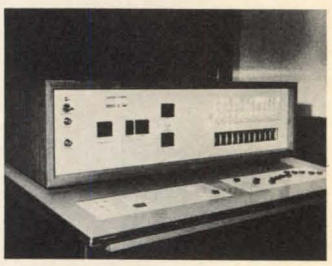
Textured tiles. Manufacturer offers wide variety of ceramic floor and wall tiles for indoor/outdoor use. Tiles are standard 12" x 12" x ½" size in matte-glazed or unglazed finish. Tiles are said to have an "excellent" wear rating from the standard Taber Abraser test. A choice of earth colors, and plain or pattern relief textures are shown in the brochure. Technical information and specs are also included. Brochure: 12 pages. INTERPACE, 2901 Los Feliz Blvd., Los Angeles, Calif. 90039.
Circle 205, Readers' Service Card

Trends in tread. Sheet rubber flooring, rubber tile, molded rubber stair treads and allied products are outlined with emphasis on their hygienic safety, "cushion" comfort, resilience, and static resistance. These properties recommend it especially for use in hospitals and nursing homes. Decorator flooring is available in a roll or tiles. Various stair treads are also available. Brochure contains a color selection chart, accessories, dimensions, description of physical properties, and specs. Standard tiles are 9" by 9" or 12" x 12" (others by request); roll width is 36". Gages are: 3/32, 1/8, and 5/16. R.C.A. Rubber Co., 1833 E. Market St., Akron, Ohio 44305.
Circle 206, Readers' Service Card

FURNISHINGS

Seat for wisdom. A cast nylon seat, suitable for use in educational institutions and other public places, is said to resist chipping, fading, scratching, and discoloration. The standard seat in a variety of colors is available with several chrome or black enamel steel bases. 8 pages. American Seating Co., Grand Rapids, Mich. 49502.
Circle 207, Readers' Service Card

LIGHTING



Lighting master. Memory device controls all lighting for large stage presentations. Single unit can set lighting or recall desired setting by use of the preset device, which also permits mixed lighting schemes. Brochure describes and explains device. Century Lighting Inc., 3 Entin Rd., Clifton, N.J. 07014.
Circle 208, Readers' Service Card

Dimensional lighting. "Recessed Open Reflector Downlites and Recessed Open Reflector Accentlites" is a colorful and comprehensive guide to planning lighting systems for interior space. Performance characteristics are given for each component of the lighting line. Rapid estimate illumination charts are plotted for each unit. Ideas abound for lighting effects in large spaces and for more intimate areas. A table and ordering chart contains dimensions, wattages, lamps, finishes and all standard and optional features. Brochure. 16 pages.

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sheep
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Gotham Lighting Corp., 37-01 Thirty-First St., Long Island City, N.Y. 11101.
Circle 209, Readers' Service Card

OFFICE EQUIPMENT



Drafting aids. Catalogue lists a complete line of manufactured and distributed products of drafting furniture, fixtures, accessories, and supplies. Divisions include: equipment for drafting environment, materials for engineering graphics, sensitized drafting material for drawing cost reduction, professional tools for drafting and illustration, and training material for improving employee skills. Prices and order blanks included. Catalogue No. AF 656, 100 pages. Fredrick Post, A Teledyne Company, P.O. Box 803, Chicago, Ill. 60690.
Circle 210, Readers' Service Card

ROOFING

Drainage conductors. Included in this line of roof drainage products are gutters, conductor pipes, joints, caps, and accessories. All components are galvanized and painted with a polyester enamel, and are said to be virtually weather resistant. A tight fitting coat of 1.5 oz of zinc covers the base metal, supplying corrosion resistance. Each component is illustrated and described. Brochure. 4 pages. Wheeling Corrugating Co., Div. Wheeling Steel, Wheeling, W. Va. 26003.
Circle 211, Readers' Service Card

Two-way ventilators. Roof ventilators, square or rectangular, for use as intake or exhaust ducts. Bulletin describes corrosion-resistant fiberglass construction, and charts sizes and capacities. 4 pages. Williams Bermuda Corp. 914 Westminister Ave., Alhambra, Calif.
Circle 212, Readers' Service Card

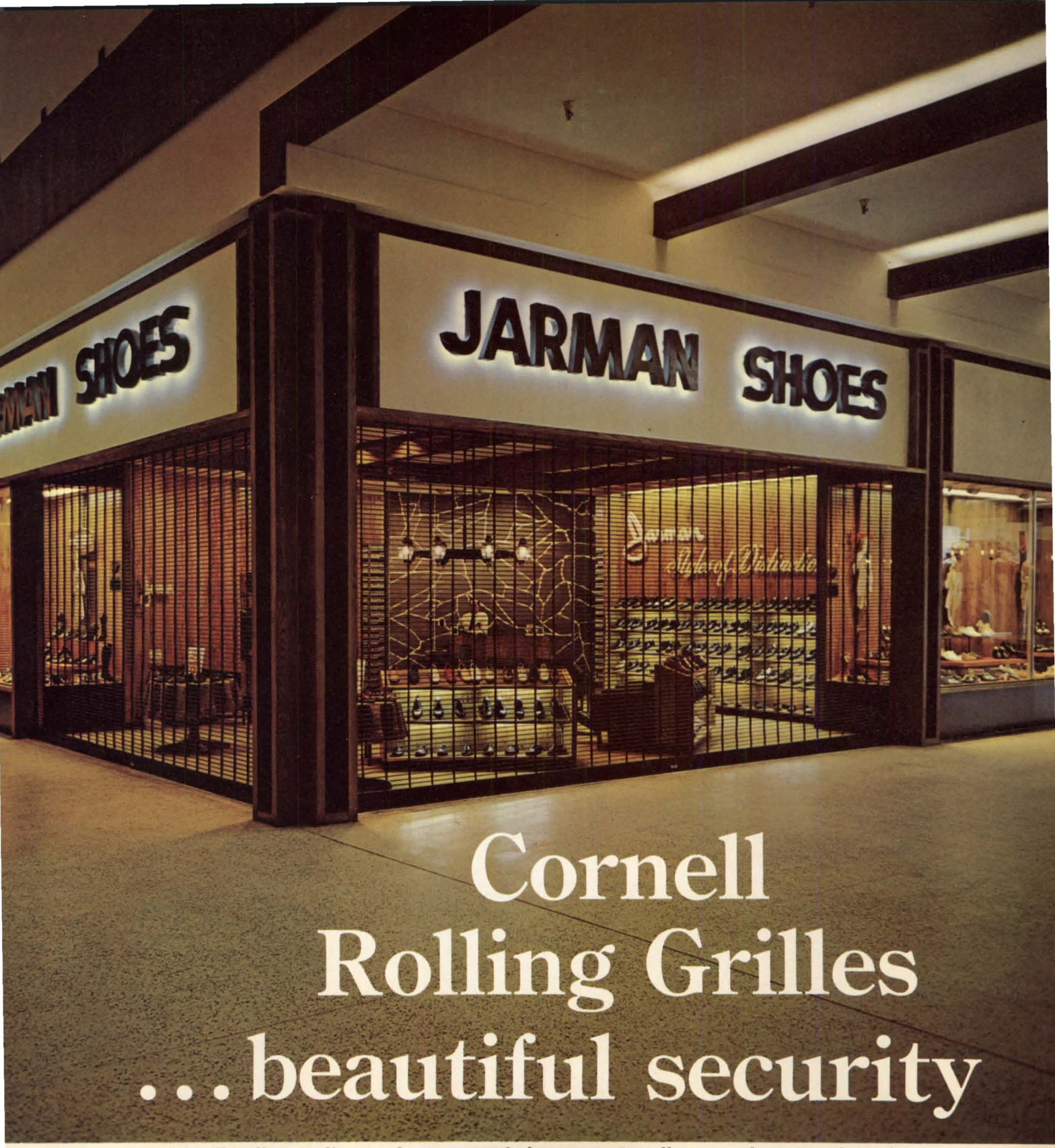
SURFACING

Wall power. Videne wall paneling has thermoplastic film surface laminated to a hardboard panel or other substrate. For use in new installations or over old walls, Videne is claimed to have up to three times the abrasion resistance of ordinary high-pressure laminates. In addition, it is said to be stain- and fade-resistant. Step-by-step installation details are given for the panels as well as doors, and movable partitions. A specially developed adhesive is said to eliminate furring and stripping. Brochure contains a complete color chart showing 15 woodgrain patterns and 32 solid colors. 12 pages. Modern Laminates, Inc., Holland, Mich. 49423.
Circle 213, Readers' Service Card

Terrazzo tabulations. Synterra, a thinset terrazzo flooring, is said to fuse chemically as well as mechanically to any substrate. Its primary allure for architects might be its reduced weight of less than 3 psf, and its thickness of only 3/16". Synterra is seamless; it is also conductive. Data includes a chart of physical properties for the terrazzo, a similar chart for terrazzo containing decorative mineral chips, a host of details, and an annotated spec guide. Samples are also included. Portfolio. Synterra Corp., 1227 Blumenfeld Dr., No. Sacramento, Cal. 95813.
Circle 214, Readers' Service Card

WALLS/PARTITIONS

Vinyl wallboard. Vinyl surfaced gypsum wallboard for use in interior partitions, in high traffic, hard-use areas. Called "Eternawall," the vinyl provides an attractive, durable finish, while the gypsum wallboard provides a fireproof core. Panels may be laminated directly to existing wall surfaces, metal studs, wood framing or furring strips. Folder contains 15 samples of color and pattern, technical data and specs. Georgia-Pacific, Gypsum Div. P.O. Box 311, Portland, Oregon 97207.
Circle 215, Readers' Service Card



Cornell Rolling Grilles ...beautiful security

Cornell Rolling Grilles, in aluminum with duranodic bronze finish, provide full visibility with maximum protection for this store front. They coil up out of sight when opened. Also available in galvanized or polished stainless steel. Choice of motor or manual operation. Positive locking for complete security.

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On Readers' Service Card, Circle No. 412



Goya Pecan



Whistler Elm



Longfellow Chestnut



Rembrandt Cherry

Weyerhaeuser Craftwall® paneling now available with a Class I flame spread rating.

The Class I flame spread rating lets you introduce the beauty of fine hardwood paneling in most critical commercial applications. And if Class II is what the codes demand, relax. The U. L. label for flame spread rating in the Class II range is now standard in our Weyerhaeuser Craftwall line.

Internal improvements are just part of the story on new Weyerhaeuser Craftwall. We also have made some sweeping style changes that let you select from a greater variety of species than ever, in 14 color tones and finish treatments.

That's with standard Craftwall.

Custom Craftwall is something else again — a whole new idea in paneling. It's the closest thing yet to architecturally matched hardwood. Now you can order Craftwall with no grooves at all. Or pick regular V-grooving. Or select any of five grooves from 1/4″ to 1″ wide. We can



Audubon Oak (custom grooved)



Van Gogh Paldao (custom grooved)



And you can custom design your own panels.

lace the grooves in any combination or spacing arrange-ent your design scheme calls for.

Your local Weyerhaeuser Architectural Specialty Dealer as products and samples you can examine. In the mean-me, we would be glad to provide all the technical details bout our new 7/16″ Craftwall line, as well as the latest bout our new 1/4″ Forestglo® and Muralwood® lines. Just end us the coupon.

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To: Weyerhaeuser Company
Box B-5721, Tacoma, Wash. 98401

By all means, send me the facts about your new paneling lines.

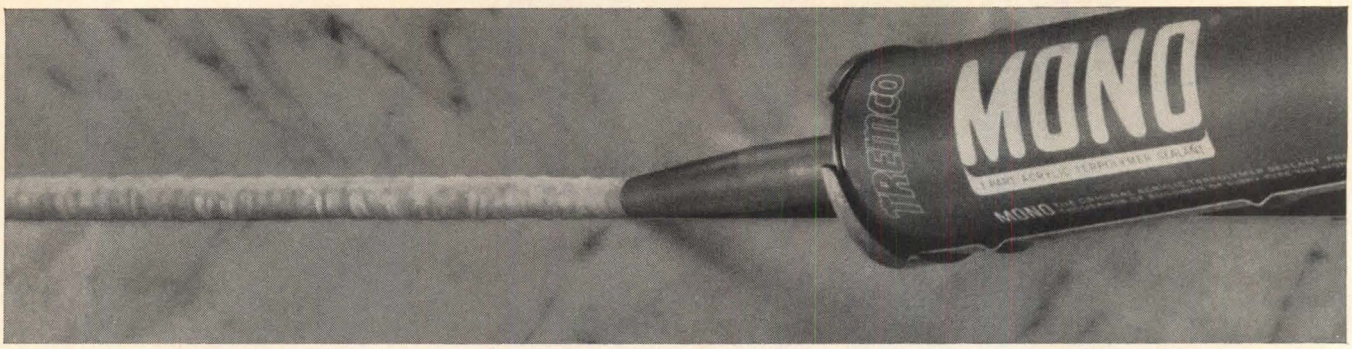
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The man who sells it.

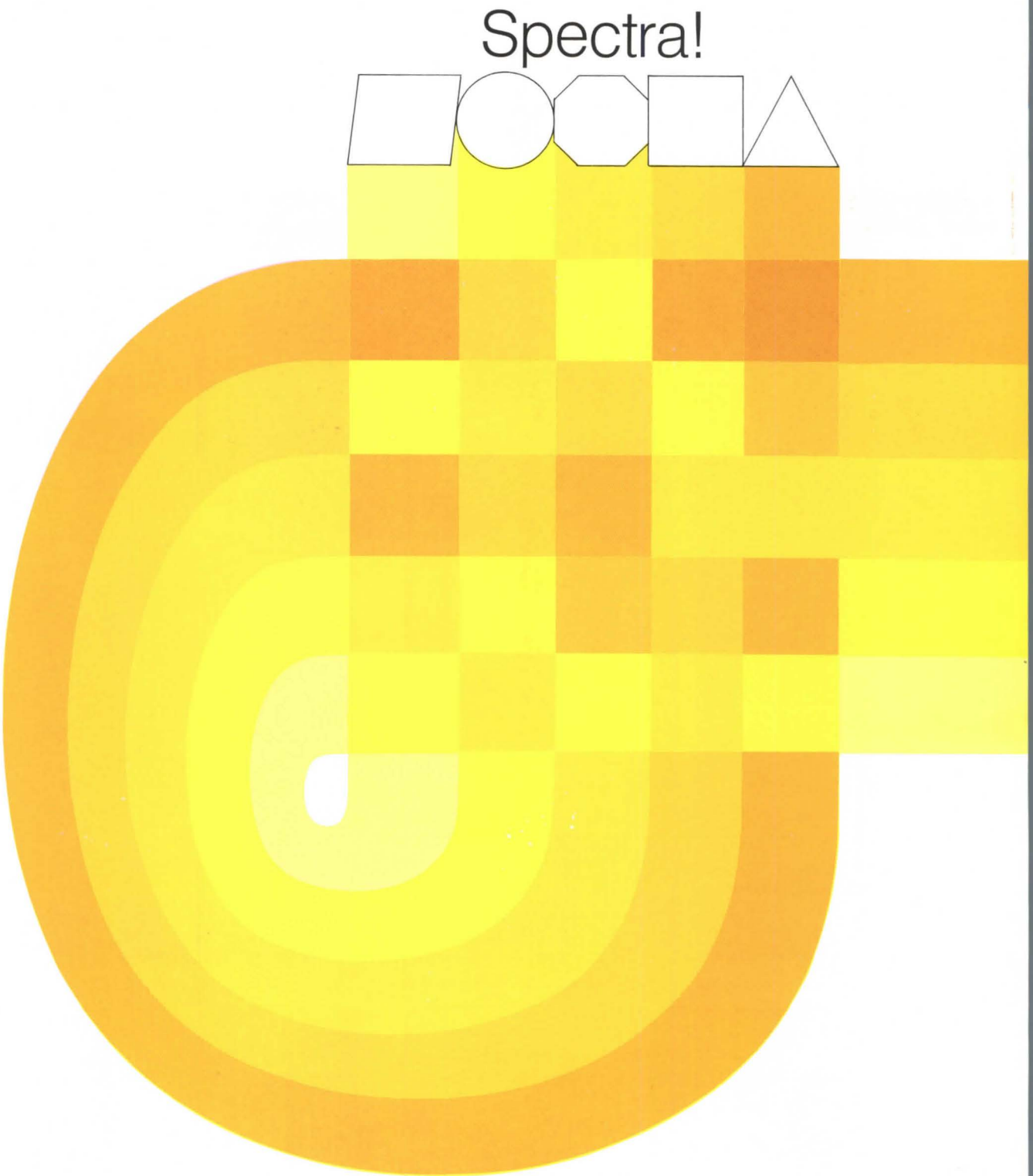


When you order MONO construction joint sealant, you get a lot more than a great product in a tube. □ You get a Tremco Representative... a sealant specialist whose only job is to make sure you get permanent, weather-tight joints. And his way of "making sure" is to help you every step of the way...including on-the-job instruction. □ Most often, the Tremco man will recommend MONO. Because MONO penetrates dust and moisture to get a solid grip on joint faces...and gives you a tight, permanent bond under less-than-ideal conditions. □ But if MONO isn't the right sealant for your job, the Tremco man will tell you. And he'll help you select one of the 14 other Tremco sealants that will do the job. □ So call your local Tremco man. With him sticking to your job, you can be sure the sealant will, too. □ The Tremco Manufacturing Company, Cleveland, Ohio 44104, Toronto 17, Ontario.

TREMCO
The water stoppers

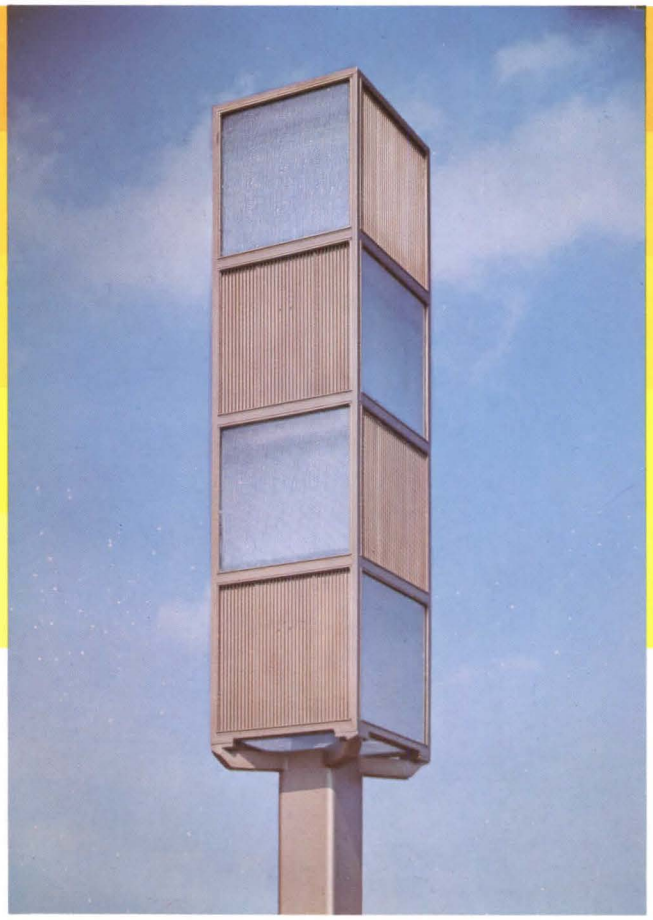
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Look what we've done to lighting:



Wide-Lite has made lighting a dramatic new expression of style and function!

Spectra I



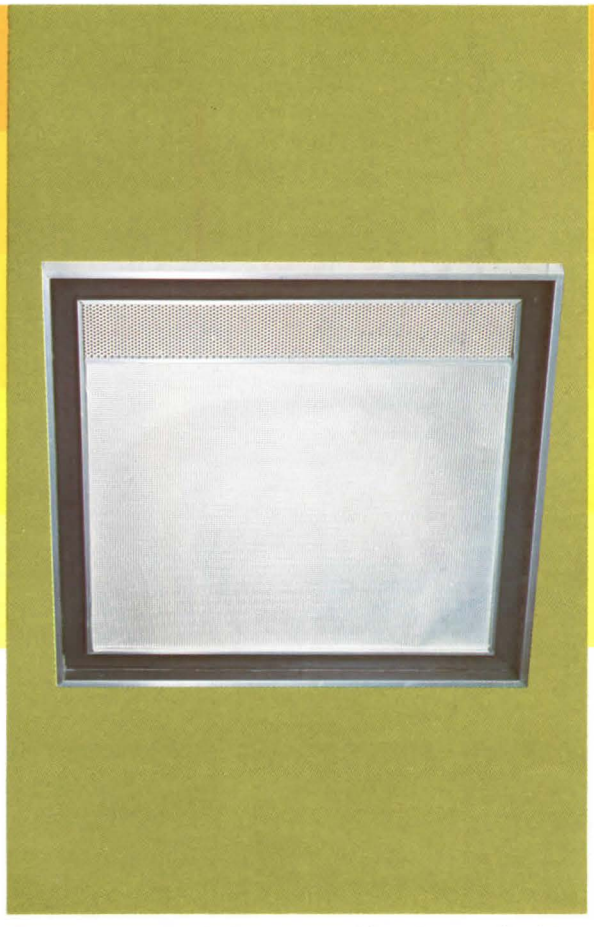
Here's the most impressive large area light you'll see on *any* shopping center, parking lot, plaza or other outdoor area! Spectra I has high style and high performance. It's a striking beauty in daylight—and at night it lights more than an acre! Light from four 1000 watt (or 400 watt) mercury vapor or metal halide lamps is controlled by highly efficient reflectors from four opposing sides in a double overlap pattern. And Spectra I has a bottom glass lens, so light is directed downward—eliminating the dark area around the base of the pole. Handsome Spectra poles preserve the linear design theme. See our catalog 24S-353.

Spectra II



Spectra II is another beautiful phase of the evolution in lighting which Spectra represents: the use of luminaires as architectural elements. Spectra II is classic in its simplicity of styling. Trim. Clean-lined. Beautiful. And its 360° pattern is so smooth you won't find an uneven area—not even around the pole base (the bottom lens lets light come down, as well as out). Parking areas, driveways, walkways, even covered shopping malls, all look better in lighting from Spectra II. Models for 100 to 1000 watt mercury vapor and metal halide lamps are available.

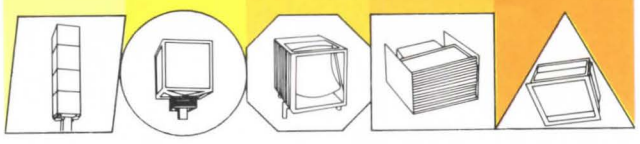
Spectra V





Spectra moves indoors—making it practical to put the higher light output of mercury vapor lamps to work in commercial interiors with either recessed or surface mounted models. No light source available for commercial use can match mercury vapor lighting for high light ouput, operating efficiency and long life. Add the natural color rendition of new deluxe white mercury vapor lamps, and you have an unbeatable combination. Both recessed and surface mounted Spectra V's deliver smooth lighting from low ceilings . . . without bothersome glare, even when high wattage 1000 watt mercury vapor lamps are used.

Spectra... most exciting look in lighting—from Wide-Lite!



Spectra is an element of architecture, and an advance in lighting. Because Spectra luminaires look better—and illuminate better—than any luminaires designed for modern high wattage, high efficiency light sources. Now you can put luminaires and lighting to use with your buildings and property as never before. The choice is yours. Find out how, with Spectra. Write to Wide-Lite Corporation, P. O. Box 191, Houston, Texas 77001.

Wide-Lite

Manufactured in United States, Australia, Belgium, Canada, Great Britain and Mexico.
A Division of Esquire, Inc.

TCS

Why coat stainless steel?

. . . because proper soldering of stainless steel requires an extra step of pretinning or use of corrosive fluxes. These fluxes must be removed after soldering to prevent attack on the stainless.

TCS solders perfectly using a non-corrosive rosin flux. Pretinning is unnecessary.

. . . because architectural metals are subject to corrosive attack in severe chemical, industrial or marine environments.

TCS enhances the proven ability of stainless steel to resist corrosive attack under these conditions.

. . . because the reflective surface of stainless steel may sometimes be undesirable in architectural applications.

TCS weathers naturally to a predictable, uniform and attractive dark gray. If color is desired, it can also be painted.

TCS, Terne-Coated Stainless Steel, is 304 nickel-chrome stainless steel covered on both sides with terne alloy (80% lead, 20% tin). It is a product of Follansbee Steel Corporation, Follansbee, West Virginia.

FOLLANSBEE

FOLLANSBEE STEEL CORPORATION • FOLLANSBEE, WEST VIRGINIA

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Let's take it from the top







CITY WATER BOARD, CENTRAL HEATING/COOLING PLANT

San Antonio, Texas
"HemisFair"

Five cells: 30,000 GPM 96°F-86°F-78°F
Bernard Johnson Engineers, Inc.
Houston, Texas

An outstanding example of a well-planned Central Chilling and Heating Plant. The top view shows the cooling tower as an integral part of the structure. At *left is entrance side of* plant and transformer yard, enclosed by arched walkway to the Ceramic Cooling Tower on opposite side of building. View at right is the Ceramic Cooling Tower which is the south wall of the plant. The series of arches serve as a single air-inlet with falling water in the background which is lighted at night. The cooling tower structure is monolithic concrete for water tightness and permanency. Brick, stone, and mission tile furnish a pleasing esthetic interpretation of functional Spanish architecture. The owners, City Water Board of San Antonio, are proud of this installation and invite inspection.

...otherwise you'll never find it!

The fan assembly stack is the only tip-off that the building on the left is not just another building . . . but a Ceramic Cooling Tower integrated into a unique heating/cooling facility.

The other buildings shown here also incorporate Ceramic Cooling Towers and are outstanding examples of well planned, totally integrated designs that are possible only with Ceramic.

Ceramic Cooling Towers are more versatile in their application because of their inherent suitability to all types of structures and water cooling requirements.

We'd like to tell you all about Ceramic Cooling Towers, from the ground up.

You can find the name of your nearest Ceramic representative in Metropolitan City Yellow Pages. He's listed under "Cooling Towers". Or call us collect: AC 817/332-4105.



CERAMIC
COOLING TOWER COMPANY
a subsidiary of FIRST WORTH CORPORATION
P. O. Box 425 Fort Worth, Texas 76101 AC 817/332-4105

THE ONLY PERMANENT COOLING TOWER



NATIONAL CASH REGISTER
San Diego, California
Four cells: 12,000 GPM 95°F-85°F-72°F
Frank L. Hope & Associates, Architects
San Diego, California
Geo. W. Dunn & Associates, Engineers
San Diego, California

The Ceramic Tower is one wall of this Central Chilling Plant. The plant is designed to serve a new complex for this progressive concern. As their needs grow, so will this tower. Currently the capacity is projected to be doubled to 8,000 tons.



TEXAS TECHNOLOGICAL COLLEGE
Central Heating & Cooling Plant
Lubbock, Texas
Two cells: 18,400 GPM 105°F-85°F-73°F
Pitts, Mebane, Phelps & White, Architects and Engineers
Beaumont, Texas
Zumwalt & Vinther, Consulting Engineers
Dallas, Texas

After six separate refrigeration plants were installed with Ceramic Towers, campus growth projections indicated the feasibility of a Central Plant which would supply chilled water and steam through tunnels to the entire campus. The first phase of 6,000 tons is now projected to 18,000 tons. The Ceramic Cooling Tower is an integral part of the plant, requiring minimum operating and maintenance personnel.

BREAKAGE AND SUNLIGHT... A DISPLAY WINDOW'S TWO WORST ENEMIES!

Conquer Both Hazards With Protectopane U-V!

Breakage and sunlight, a display window's two worst enemies, leave store owners vulnerable to property destruction. Breakage can result in expensive window replacement and loss of merchandise; sunlight can fade expensive display material making it worthless for re-sale. Either way, destruction cuts into profits and store owners lose money!

This needless waste can be avoided with Protectopane U-V! This new glass, specially created for store front windows, provides break-through protection *and* prevents fading due to ultra-violet light!

Protectopane U-V features a clear vinyl interlayer which acts as a repellent to ultra-violet light—lets through only 1% of the ultra-violet rays in the critical region of 380 millimicrons and below; whereas ¼" clear plate glass transmits about 52% of these harmful rays! Protectopane U-V provides color fast protection for draperies, paint, furniture, clothing and other articles behind the glass.

Protectopane U-V is almost totally impervious to break-through. Repeated heavy blows may break or crack the glass, but will not cause it to easily shatter or fall out.

Provide a double shield against display window property destruction! Write Dearborn today for complete details and specifications on Protectopane U-V!

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6600 South Harlem Avenue • Argo, Illinois 60501

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Protectopane®

UL®

LISTED
BURGLAR
RESISTING
GLASS



On Readers' Service Card, Circle No. 338

◀ On Readers' Service Card, Circle No. 405

Is resistance still a virtue?



Universal says yes, with Vectra fiber.

New Universal "Vanguard" tufted fine-gauge carpet made with Vectra® fiber resists stains, fading and wear, but can't resist being beautiful.

In Universal Vanguard, you're getting a new breed of commercial carpet. Natural tufted beauty, coupled with the stubborn stain, fade, abrasion and static resistance you expect from spun yarns of 100% Vectra olefin fiber. Available in eight tempting heather colors. The cost? Impressively low.
In short, no matter where you decide Vanguard carpet belongs . . . it belongs. In hospitals, schools, hotels, offices and all other heavy traffic areas.

SPECIFICATIONS

Pile of 100% solution dyed Vectra olefin fiber
5/64″ Gauge (12.8)
Pile Wt.—28 oz. per sq. yd.
Pile Ht.—⅛″ or .125
Stitches per inch—10
Tufts per sq. inch—128
Primary backing—4 oz. 100% non-woven polypropylene
Passes ASTM E-84 flame spread test on jute back

Secondary Backings
(wt. per sq. yard)

1. 40 oz. high density rubber
2. 9 oz. jute
3. 60 oz. vinyl for indoor-outdoor

For samples and information on Universal Vanguard, write:
Universal Carpets, Inc.
Department A, Ellijay, Georgia 30540

NAME_____

COMPANY_____

ADDRESS_____

CITY_____

STATE_____ ZIP_____

ENJAY Vectra® olefin fiber is manufactured by Enjay Fibers and Laminates Company, Odenton, Maryland, a division of Enjay Chemical Company. Odenton: (301) WO 9-9000. New York: 350 Fifth Avenue, (212) LO 3-0720. Charlotte: One Charlottetown Center, (704) 333-0761. Enjay makes fiber, not carpets.

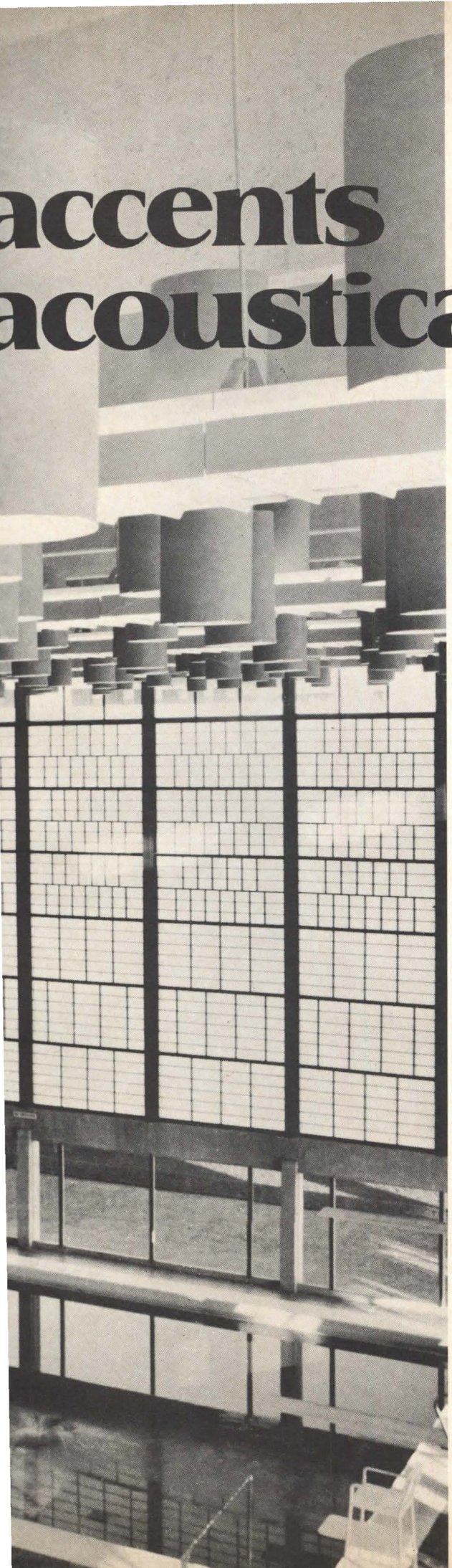
Vectra . . . the fiber that believes resistance is still a virtue.

Keene imagination



SIMON FRASER UNIVERSITY POOL
VANCOUVER, B.C.

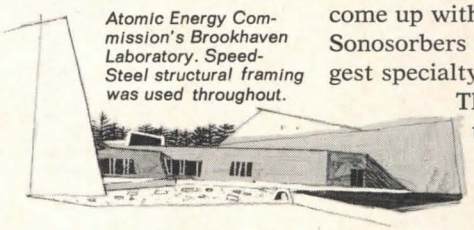
ARCHITECT: DUNCAN S. McNAB AND ASSOCIATES
VANCOUVER, B.C.



accents acoustical products.

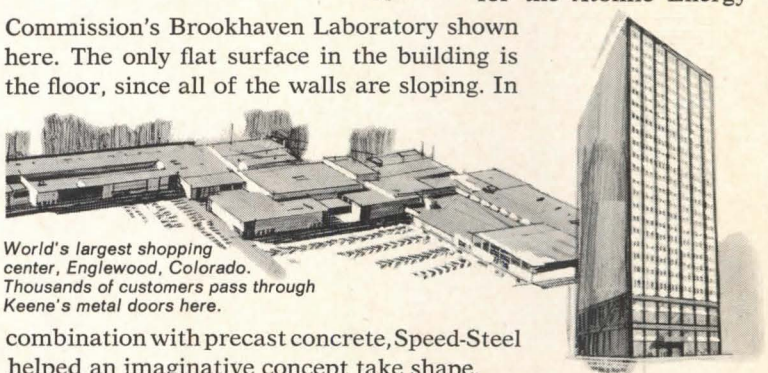
If you've ever tried to make yourself heard around a huge indoor swimming pool, you'll appreciate Keene's solution to a tough acoustical problem at Simon Fraser University, Vancouver. The highly reflective surfaces make speech and hearing practically impossible. That's why those Keene Sonosorbers are hanging from the ceiling. More than 100% sound absorption is obtained from each square foot of their surface area.

Whatever acoustical problem comes up, chances are Keene has come up with the product to solve it. Sonosorbers are just part of the biggest specialty line in the business.



Atomic Energy Commission's Brookhaven Laboratory. Speed-Steel structural framing was used throughout.

The most versatile structural framing line in the business is Keene Speed-Steel,™ chosen for the Atomic Energy Commission's Brookhaven Laboratory shown here. The only flat surface in the building is the floor, since all of the walls are sloping. In combination with precast concrete, Speed-Steel helped an imaginative concept take shape.



World's largest shopping center, Englewood, Colorado. Thousands of customers pass through Keene's metal doors here.

If you open doors, chances are you've handled some of Keene's door products. Keene metal doors, both fire-rated and non-rated, are in thousands of America's schools and colleges, offices and factories.

North American Rockwell Building, Pittsburgh. Keene movable wall systems were chosen for interior design flexibility.

Keene imagination works for you in products like our movable partitions and architectural mesh, too. Six movable wall systems give you complete freedom of choice in paneling materials, flexibility and sound control. Keene architectural mesh is a decorative product every bit as practical as it is attractive. It diffuses light and increases airflow, decreasing air conditioning costs.

If you've gotten the impression that Keene makes a diversified line of quality building products that may help on your next job, you're right.

For complete information on Keene acoustical products and a general catalog of Keene building products, write to Dept. P-5, Keene B-E-H, 500 Breunig Avenue, Trenton, New Jersey 08602.

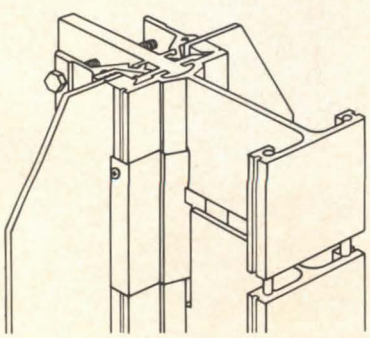
KEENE
CORPORATION

We've just begun to grow.

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About the high cost of beauty and other myths.



Pittco's new Seventy-Five Curtain Wall system has upset a lot of old rules for buildings. Like the one that says beauty should cost a lot. Nonsense.

The Seventy-Five Curtain Wall lets you erect your building without compromising your design or budget. It's available in your choice of five anodized aluminum colors, each integrated with Pittco® entrance systems and storefront metals. And Seventy-Five Curtain Wall accommodates any standard thickness of glass or spandrel.

We've also squelched those ugly tales about curtain wall leakage with our rainscreen system, a proved method of pressure equalization. Keeps tenants dry and civil.

We've even made it clumsyproof with a controlled-pressure glazing system for secure installation without breakage. Interior glazing saves expensive days of glazing and erection. And we've subjected Seventy-Five Curtain Wall to a merciless series of performance tests. (It's satisfied all the standards of NAAMM Tests A, B, C-1 and C-2.)

Pittco's new Seventy-Five series has erased all the old slander about curtain walls. Take advantage. Write for complete details: Pittco Architectural Metals, Box 930, Kokomo, Indiana 46901.

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To complement the 3 R's, Wilson-Art High Pressure Plastic Laminates offer the 3 E's—Esthetics, Engineering, and Economics. Durable Wilson-Art woodgrains and solids save on maintenance while creating an attractive, congenial atmosphere for education. At Wilson-Art, we're schooled in service—which is why we're "in service" in so many schools.

HARVEST GOLD D57

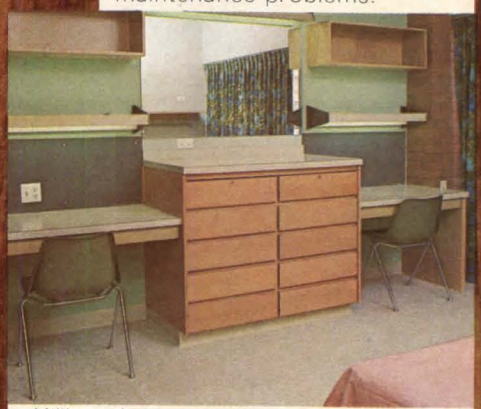
FRUITWOOD F332T



In these library carrels, Wilson Wall Paneling has been easily cut to allow insertion of grillwork. The result is a handsome and functional decor at minimum cost.



Wilson-Art covered tables add a pleasing touch to the decor of dining areas and reduce maintenance problems.



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Ohio University Convocation Center, Athens, Ohio
Architect: Brubaker & Brandt, **Engineer:** Fling & Eeman, Inc.
Steelwork: Bristol Steel & Iron Works, Inc.
General Contractor: Knowlton Construction Co.



Stargets Golf Game, Hanover, Massachusetts
Designer-Owner: Family Leisure, Inc., **Engineering Consultant:** Simpson, Gumpertz & Heger, Inc., **Project Engineer:** John F. Notemeyer, **Steelwork:** Chestnut Welding & Iron, Inc., **General Contractor:** Taverna Brothers



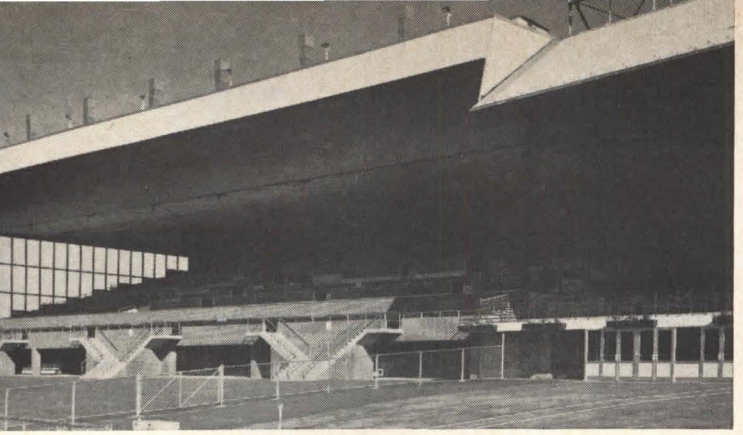
Hampton Roads Coliseum, Hampton, Virginia, **Architect:** A. G. Odell, Jr. & Associates
Structural Engineer: Severud, Perrone, Sturm, Conlin, Bandel, **Steelwork:** Bristol Steel & Iron Works, Inc., **General Contractor:** McDevitt & Street

Great Flight Cage, Washington, D. C.
Architect: Daniel Johnson and Mendenhall, **Structural Engineer:** Donald J. Neubauer
Consulting Detailer: Rick Engineering, **Fabricator:** Fabricator's Steel Corporation
General Contractor: Edrow Engineering Co., Inc.



I-XL Furniture Co. Plant, Elizabeth City, North Carolina
Architect-Engineer: Wiley & Wilson
General Contractor: Basic Construction Co.





Brandywine Raceway Clubhouse, Wilmington, Delaware
Architect: Lionel K. Levy, **Engineer:** Robert Rosenwasser
Fabricator: Belmont Iron Works, **Erector:** McCormick Construction Co., Inc.
General Contractor: Ernest DiSabatino & Sons



Museum of Automobiles, Petit Jean Mountain, Arkansas
Architect: Ginocchio, Cromwell, Carter & Neyland
Structural Engineer: Severud, Perrone, Sturm, Conlin, Bandel
General Contractor: Dickens-Bond Construction Co.

We work closely with architects and engineers on cable applications like these

Bethlehem has furnished the steel strand, wire rope, and end-fittings for many of the nation's cable roofs. It all began with Raleigh Arena, the country's first major cable-roof structure, built in 1953. Since then, we've been involved in a wide variety of cable roofs and related cable applications.

Some of the structures we've been associated with in recent years are shown on these pages. Each combines the bold approach of cable construction with a low-cost column-free interior.

Over the years, we've gained much experience in this field. And we've assembled a considerable amount of data. Because of this, we've been able to cooperate with designers in furnishing information on cables, end-fittings, and complete assemblies. We've also worked closely with them in detailing the cables and supplying them to precise specifications.

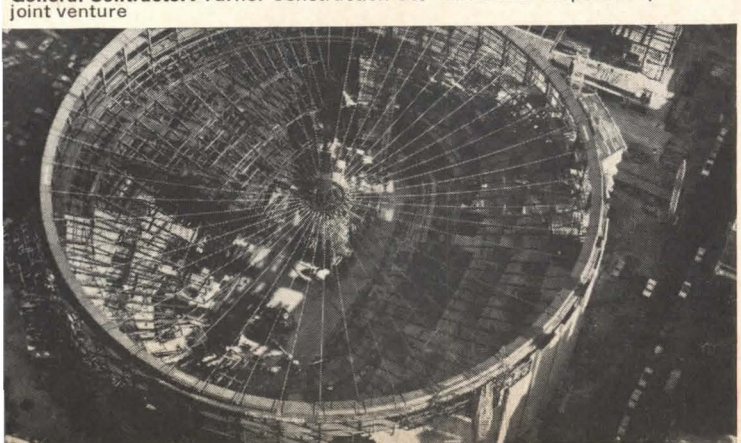
Our library of technical and design data on this subject is one of the most complete in the industry. If you'd like to receive any of these materials, just write to: *Room 1049A, Bethlehem Steel Corporation, Bethlehem, PA 18016.*

BETHLEHEM STEEL

BETHLEHEM STEEL

Steel for Strength

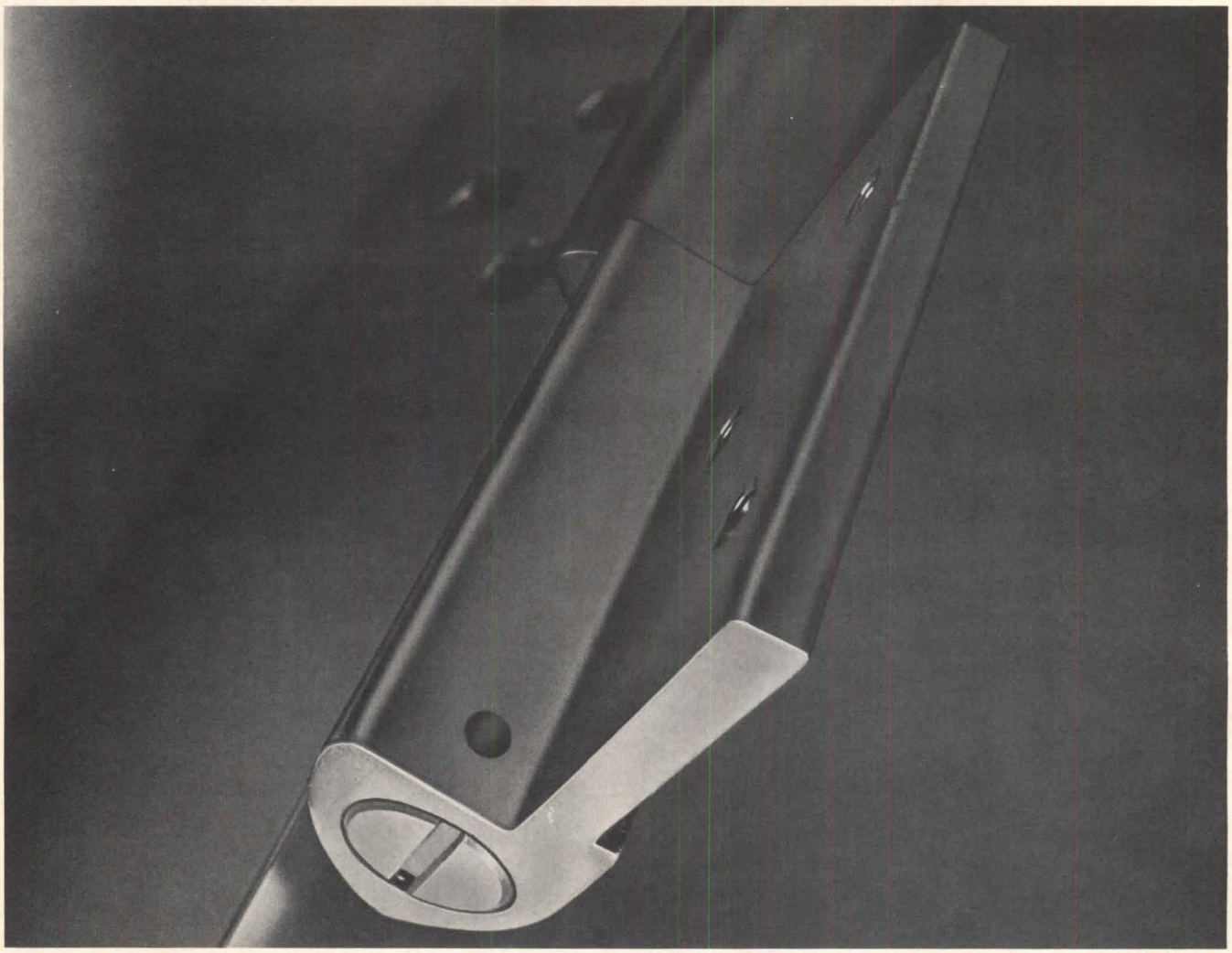
Madison Square Garden Center, New York City
Architect: Charles Luckman Associates
Engineer: Severud, Perrone, Sturm, Conlin, Bandel, **Steelwork:** Bethlehem Steel
General Contractor: Turner Construction Co.—Del Webb Corporation, a joint venture



Travelers Insurance Pavilion (World's Fair—dismantled), Flushing, New York
Architect: Kahn & Jacobs, **Designer:** Donald Desky Associates, Inc.
Structural Engineer: Lev Zetlin & Associates, **Steelwork:** Bethlehem Steel
General Contractor: George A. Fuller Corporation



Confidential.



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But little things *do* mean a lot. Case in point: This beautifully designed patented, ball bearing hinge has a little something extra that means *quite* a lot: the set screw in the lower half of the hinge.

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Eagle Turquoise

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Citizens and Southern Bank, North Avenue, Atlanta, Georgia.

General Contractor:
Beers Construction Company
Architect:
Aeck Associates, Inc.
Electrical Engineer:
Bush, May & Williams

Let your imagination soar...with All-Electric design.

All-Electric design gives you the freedom to take an idea born of your free imagination and turn it into a reality. The design of the Citizens and Southern Bank of Atlanta is a fine example. A 250-foot tower is suspended over a raised platform base for a circular bank building and a seven-level parking garage. It's a striking concept and All-Electric design made it a reality.

All-Electric design—with electric heat—doesn't depend on the elaborate distribution networks required by flame heating. Instead, it offers the most versatile variety of heating systems. Systems intermixed in one building. Systems with room-by-room temperature control. Systems using heat-by-light. *All* of them compatible with electric cooling.

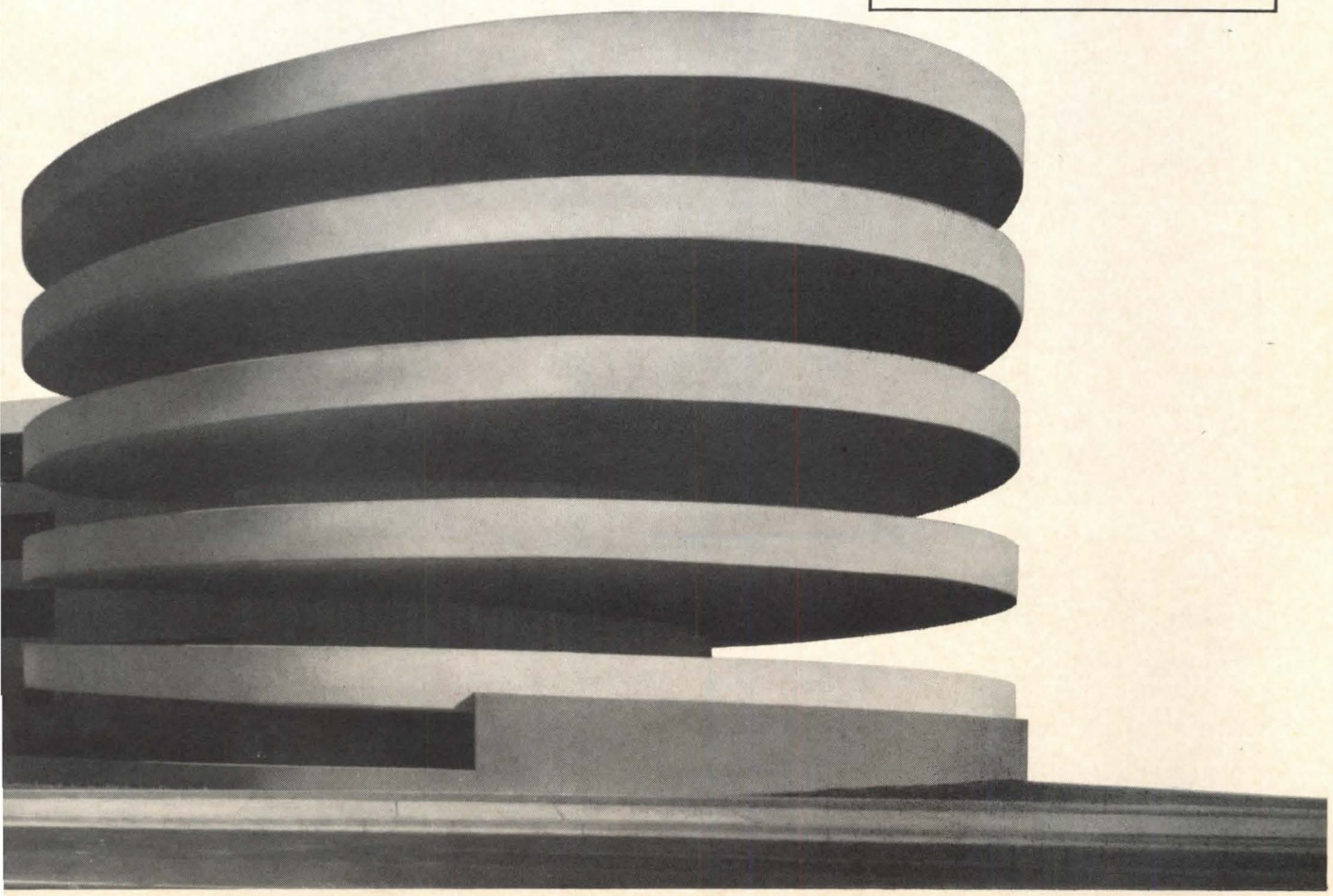
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All-Electric design

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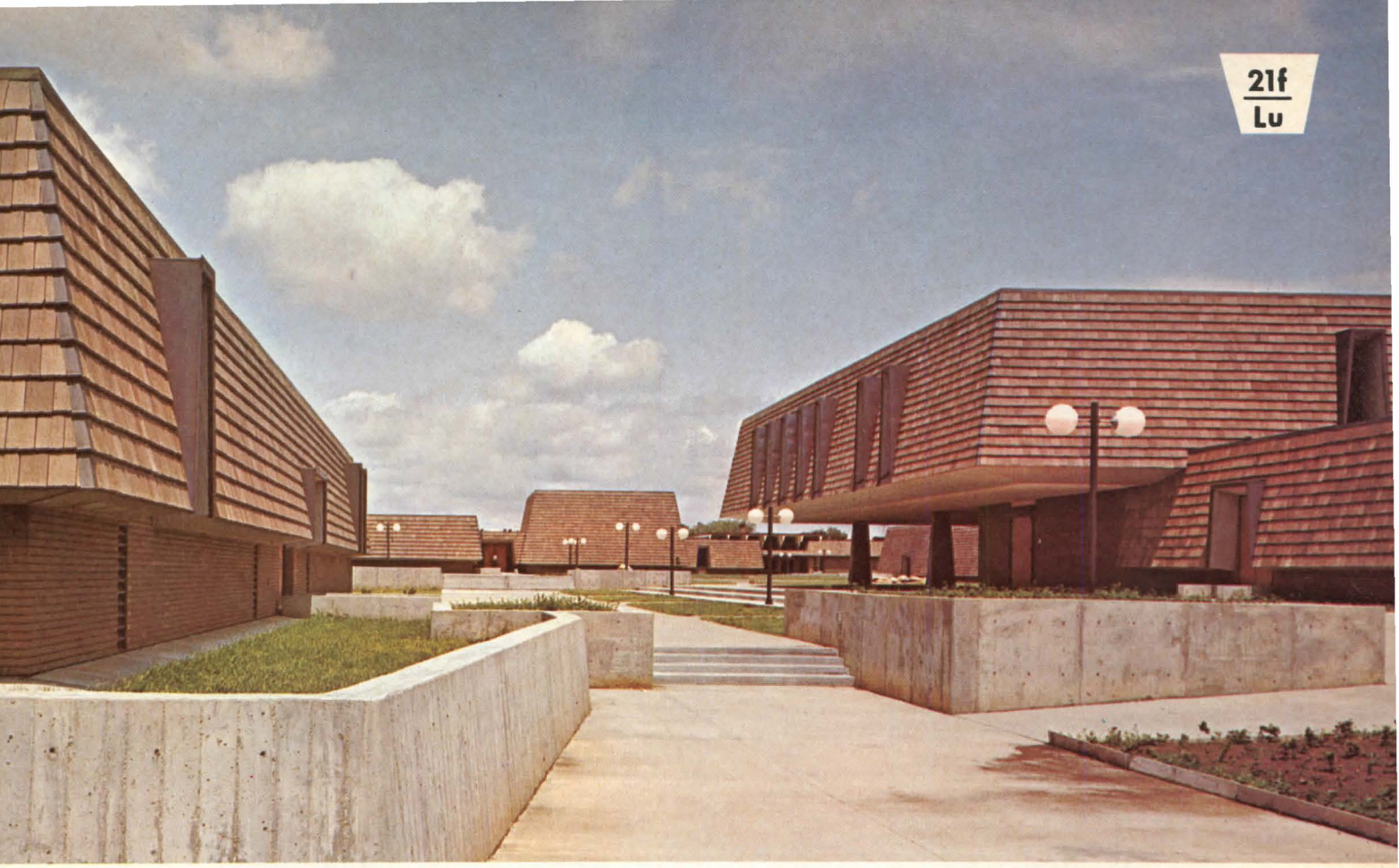
Edison Electric Institute
750 Third Ave., N.Y., N.Y. 10017



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GRANT PULLEY & HARDWARE CORPORATION 49 High St., W. Nyack, N.Y. 10994/944 Long Beach Ave., Los Angeles, Calif. 90021



Butler County
Community Junior College
El Dorado, Kansas

Architects: Schaefer-Schirmer
& Eflin

Roof: Designer Early American
by Ludowici-Celadon Co.

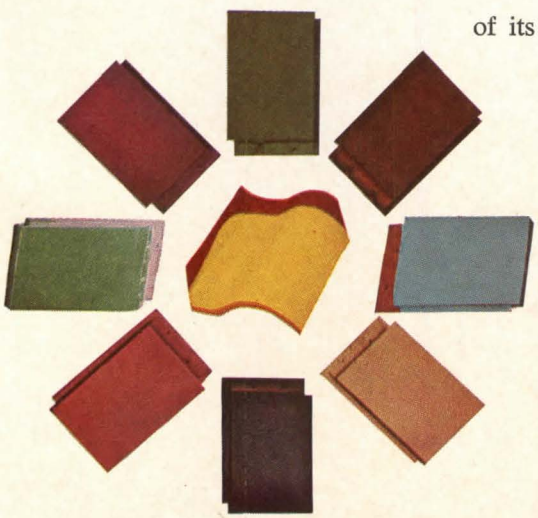
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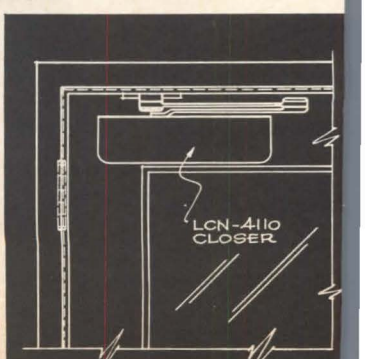
UNIFORM SYSTEM
Division No. 7



The Cannery, San Francisco, California. Joseph Esherick and Associates, Architects, San Francisco.

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"As long as the market place is structured so that exorbitant profits can be gotten by poorly designed and ugly buildings, those buildings will be built, whether they are built by developers whose chief officers are architects or accountants."

VINCENT KLING



EDITORIAL

Poverty, rotting inner cities, and the demands for prosperous commercial buildings have spawned a plethora of new professionals to contest the architects' status as leader of the environmental team. Systems analysts, university departments, research organizations, and think tanks vie for proliferating Government contracts to study the problems of poverty and blight. On the other hand, the demands of economic expansion requiring quick and efficient building to further economic growth encourages entrepreneurs to expand their services to compete with those traditionally furnished by the architect.

The architect, in his self-proclaimed role as master builder, now finds himself competing with a formidable and highly skilled building professional — the construction management consultant. This recently emerged specialist has proven his ability to undertake major building projects, completing them on time and on budget, often retaining prestigious architects "to do the art." At the other end of the scale, the traditional villain, the package builder, has boldly increased his operations, expertise, and building quality to become even more formidable competition.

The competence of the latter two new professionals threatens the architect in that area where his record is far from impressive. The AIA study on the economics of architectural practice showed most architects less than inspired businessmen. The managerial skills of American corporations have proven their ability to tie down the free-world markets. There is no indication that business will do less well in competition for the new markets of poverty planning and prosperity building. This is clearly indicated by the widespread mergers now taking place. Managerial specialists acquire design firms, rather than the reverse.

Despite the competition of the new professionals, architects seem to be enjoying unprecedented prosperity as construction continues to grow at a pace faster than the supply of design-trained professionals. Affluence filters down from the large firms at the top, which conduct studies in urban blight and plan new cities, to the under-five-man-offices designing a block or two for an urban renewal project. An affluent middle and upper class keeps the single practitioner and architectural publications liberally supplied with vacation houses and ski lodges. On the other hand, the slow progress in correcting the ills of our inner cities seems to assure further unrest and more planning.

To answer the competition posed by the new professionals, the major architectural firms have developed large, comprehensive planning and construction management divisions. Smaller design firms place themselves in a better competitive position through partnerships and mergers. In the meantime, design is everywhere assuming a larger scale. Architects become city and regional planners, contractors take over building feasibility studies and building finance, while the subcontractors, using performance drawings, design the buildings.

The future of the architect in the large firms or in the design firms acquired by the new professionals does not seem to depend on his developing a business sense or increasing his skill as a builder. Instead, it lies in that realm of expertise in which everyone assumes he is the most competent — that is, design, value judgments, use of space, and total design concepts. This has been illustrated by the tendency of large firms to upgrade their buildings by hiring talented young designers. On the other hand, the entrepreneurs, realizing culture has proven time and time again to be the commodity that sells all others, retain prestigious architects to style their projects.

Design professionals reap benefits from all directions. Free enterprise, the mainspring of our economy, is responsible for our present affluence; it is also responsible for the poverty and blight that is the source of our present urban crisis. It seems the design professionals, new and traditional, will profit from both as we continue to study our problems and put up more of the same buildings. ■

Forrest Wilson



THE NEW ENVIRONMENTAL PROFESSIONALS CHALLENGE TRADITIONAL PRACTICE

Asssociate Editor Ruth H. Cheney and members of the P/A staff developed this issue with the assistance of consulting editor Paul B. Farrell, Jr., an attorney, urban planner, economist and graduate architect who helped develop the original concept.

"Traditionally our professions have been under attack by package builders and contractors. In the future our position will be attacked by industries who find themselves with research departments, bright young men and computers who have run out of things to do."

GEORGE E. KASSABAUM, PRESIDENT, AIA.

Two years ago, P/A predicted in its issue on Performance Design (AUGUST 1967 P/A) that a new breed of non-architect professionals — systems analysts, computer programmers, space programmers, management consultants, etc. — would begin sooner or later to enter environmental design fields. Today, this prediction has been realized. This new group of professionals, having conquered space and nearly reached the moon, is beginning to reorient itself to the far more difficult problems of the nation's failing urban systems. Many of the new group are employees of large corporations (about 12,000 of them), and their outlook is different from the architects' because they have no tradition of "professional ethics," state licensing boards, or any of the other paraphernalia that dignify older professions.

Another section of the new professionals work in nonprofit research organizations or "think tanks" such as the Rand Corporation and Stanford Research Institute, who compete for the same types of contracts that profit-motivated companies seek. Both profit and nonprofit organizations also have to compete against the contract-seeking universities with staffs of professional sociologists, psychologists, urban planners, systems analysts and architects. Several new programs at UCLA, Wisconsin, NYU, and the University of Buffalo under John Eberhard appear to be directed toward the same working philosophy as systems corporations such as TRW (Thompson-Ramo-Woolrich) and Rand. They provide teams of experts drawn from several disciplines to perform studies and work on real-life problems rather than the ivory-tower problems idealized in the "design a vacation home" syndrome that architecture students are rebelling against.

Clients Encourage New Services — Although systems analysts are invading the traditional fields of architects, builders, and urban designers, they are encouraged to do so by a whole new corps of clients. These include Federal Government agencies such as the Department of Defense (DOD), Housing and Urban Development (HUD), Health, Education and Welfare (HEW), Department of Transportation

(DOT), and Commerce; large corporations such as RCA and GM; states and cities such as New York City, which hired seven or eight top "systems" firms to recommend solutions to the problems of the city. Typically, these clients seek answers to fundamental problems, and the answers they get determine the environment of millions of people.

The new clients put an increasing emphasis on scientific management, computers, quantitative methodologies such as market research, information systems analysis, economic feasibility studies, land development, cost accounting, urban planning, and operations analysis. These scientific operations relegate the design services offered by architectural firms to only a minor part of the services required by the clients. Thus, the clients seek the new professionals to solve their "pre-design" problems; and, in answering these problems, the nonarchitects do the analytic work that often determines the size and shape of the buildings to be constructed. But, more important, they determine whether or not buildings are needed, what type they should be, when and where they should be constructed, what the budget will be, who the occupants will be, and, often, what the manufacturing processes should be.

In addition to these firms, the more traditional consulting engineers and a few large A-E firms that are aware of the changing requirements of the clients are expanding their staffs to include the new professionals. These engineers and A-E firms are also beginning to acquire other consulting engineering firms and architects as well as management consultants, and other specialists to supplement their own staffs so they can do the total job "in-house." This is a deliberate policy on the part of the leading firms to enable them to gain contracts for feasibility studies in design, construction management, and building operation.

Systems Market Expanding — Planning Research Corporation, which is basically a systems analysis and computer software professional service firm born in 1954 and today worth more than $30 million, computed the size of the "professional services market" and estimated that it is approximately $7 billion a year and expanding annually. In an address on "The Future of Professional Services," the president of PRC, *Robert W. Krueger*, estimated that the "professional services market" (including medicine, law, and major industry) is about 5 per cent of the gross national product. Economists have estimated that, by the year 2000, the gross national product will be about $2 trillion and professional services will corner about 15 to 20 per cent of that. Krueger concludes that these figures indicate about a "tenfold growth in the market for professional work over the next 30 to 50 years."

> Young graduates seem no longer content to sit as underpaid draftsmen making window details.

Krueger proceeds to break down the market into several areas, including the Department of Defense, non-defense Federal agencies, state governments, and domestic industrial organizations. He notes, "Computer software encompasses approximately one-half of this potential market." Systems analysis work has an approximate market of about half a billion annually.

Even though they have no tradition of practice or ethics rules, the new professionals view themselves as professionals on a par with architects, lawyers, engineers, doctors, and accountants. And even though they are employees of large corporations whose reason for existence is to make a 15 per cent return on investment for share-holders, they think the market place is a sterner judge of professional ethics than state registration boards and AIA pronouncements. Even the land developers and the construction management companies such as Tishman and Turner, who also serve as contractors, view their roles as strictly "professional"; indeed, even a Chinese laundry advertises itself as offering "professional services in the laundry field." The only difference between the professional launderers, contractors, systems firms, management consultants, and so on, and the architects is that there are no *other* launderers, etc., sitting in judgment on their own practices and issuing licenses certifying them as being competent.

Graduates Pick Jobs with Care — What the corporations call "recruitment" is evidently a major problem for architects as well as for the corporations. Young graduates seem no longer content to sit as underpaid draftsmen making window details of vacation houses they learned to design in school. They want to work on new cities and projects that relate to the social and political problems of the moment — those affecting everyday lives and determining the shape of cities and the buildings in them. The study commissioned by General Electric (page 154) seems twice as interesting to young professionals as a single-family house, and the architectural firms are feeling the shortage of recruits. But so are the corporations, because the architectural graduating classes are turning away from the profession and the graduates are turning toward further schooling or teaching, and a lot are being absorbed by the draft. This trend started in the beginning of the 1960's, and seems to be continuing.

This issue of P/A focuses on the architects' competitors, with emphasis on the construction managers and contractors (p. 134) ; big business entering the pre-design and design fields (p. 150) ; architectural firms that are gearing up to compete with the new professionals (p. 128) ; research organizations (p. 116) ; and the consulting engineering profession's adjustment to the corporate trend in the professions (p. 132).

Most architects are not fully aware of their competition, and, to survive, they must learn what these other organizations are doing and how they can begin to offer clients either expanded services themselves — which, however, may no longer be possible for the profession to do — or to begin to find their own place as architects within the present scope of their practice.

Some of the people P/A interviewed believe that if architects learn who their new competitors are, they can then seek collaborative or joint-venture status for projects that involve eventual design output, instead of trying to compete with them. Some feel that even the design-builders (p. 142) would collaborate with willing architects. But in whatever way the teams are assembled, it is an open question whether the outcome of such collaborations would improve cities, individual buildings, or the urban environment as a whole.

TRW Systematizes Urban Design

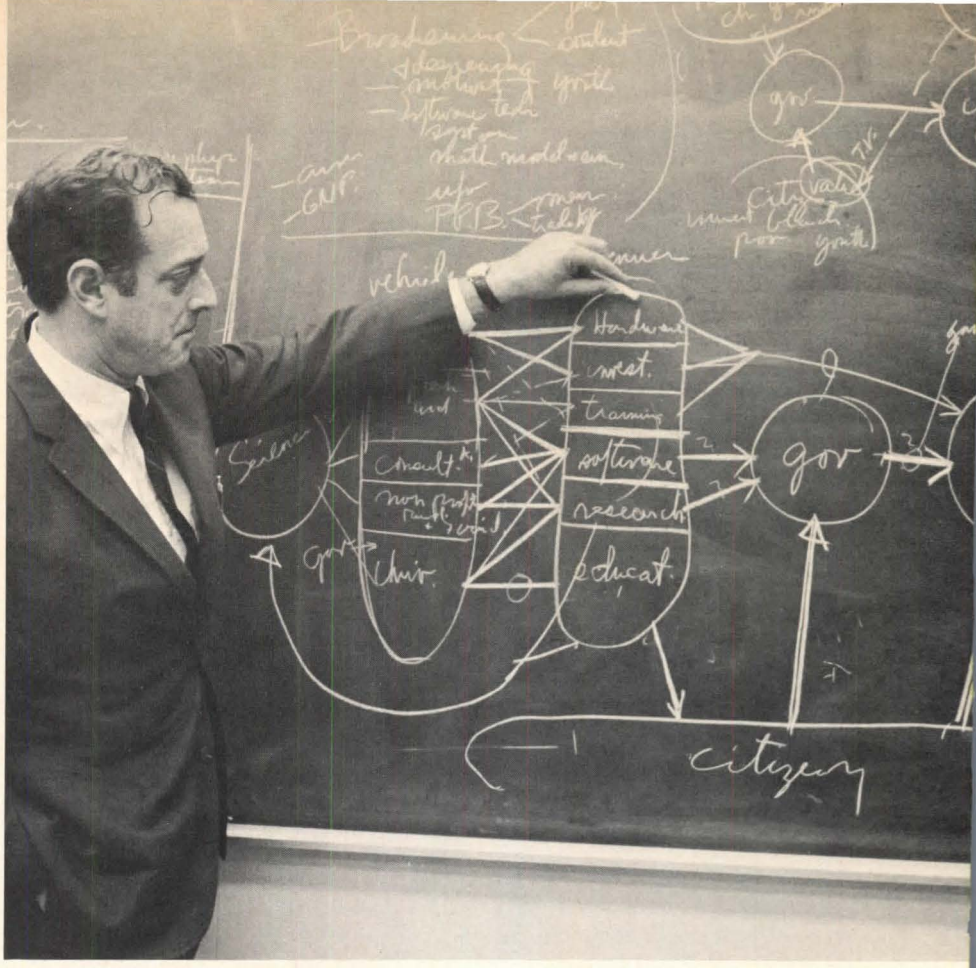
TRW, Inc., is the giant of them all — the biggest corporation of the new type. Less than 11 years old, its annual sales volume is more than $1.5 billion and growing. Ten years ago, two-thirds of its markets were in government contracts, but today these constitute less than one-half. Private industry is the major client, therefore, with government accounting for the rest.

Like all corporate giants, it is divided into several subgroups. TRW has five: Automotive, a manufacturing division that builds chassis parts, automobile, marine and aircraft parts, machinery and electrical equipment, pistons and turbochargers; Equipment, a design-develop-manufacture unit for components and subsystems for aerospace, undersea, electronic, and chemical markets. Some major products of the division are fuel pumps, total energy control systems and nuclear reactor components. A third division manufactures electronics products for the industrial, aerospace, home entertainment, and military communications markets such as auto radio tuners, capacitors, transistors, electric wave filters, and precision miniature electric motors. A fourth division is the Industrial Operations division, which takes in the technology of all the other subgroups. And the fifth division with 16,000 out of a total of 80,000 employees, is the Systems group, which includes the civil systems or urban programs — the focus of P/A's interest.

The TRW Civil Systems Program — Responsible for the trajectory route the astronauts flew in their moon circling mission and for the Intelsat III, the Comsat communications satellite that relayed live moon pictures to Europe and South America, the TRW Systems group came down to earth four years ago and expanded into what it terms the civil systems market. These systems encompass urban programs of all types, including information systems for local and state governments, the revamping of governmental administration of entire counties, and programming, design, and construction management of new hospitals.

Summing up the significance of its venture into this new area, TRW's annual report stated: "The past year [1966] brought greater applications of

THE NEW ENVIRONMENTAL PROFESSIONALS



To Hotchkiss, the most challenging work is to attempt to change the basic dynamics of social and urban forces.

Frank Hotchkiss outlines the "vehicles" that bring about changes in the urban process.

space-age systems technology to the solution of complex social problems. Within the next decade, an increasing number of civil projects will be planned and designed through the systems analysis approach. TRW, as a pioneer in this area, anticipates substantial growth in this field. To enhance its capabilities in these systems and information-handling projects, TRW's software and computing center has been doubled in size in the past two years and is now one of the largest in the nation."

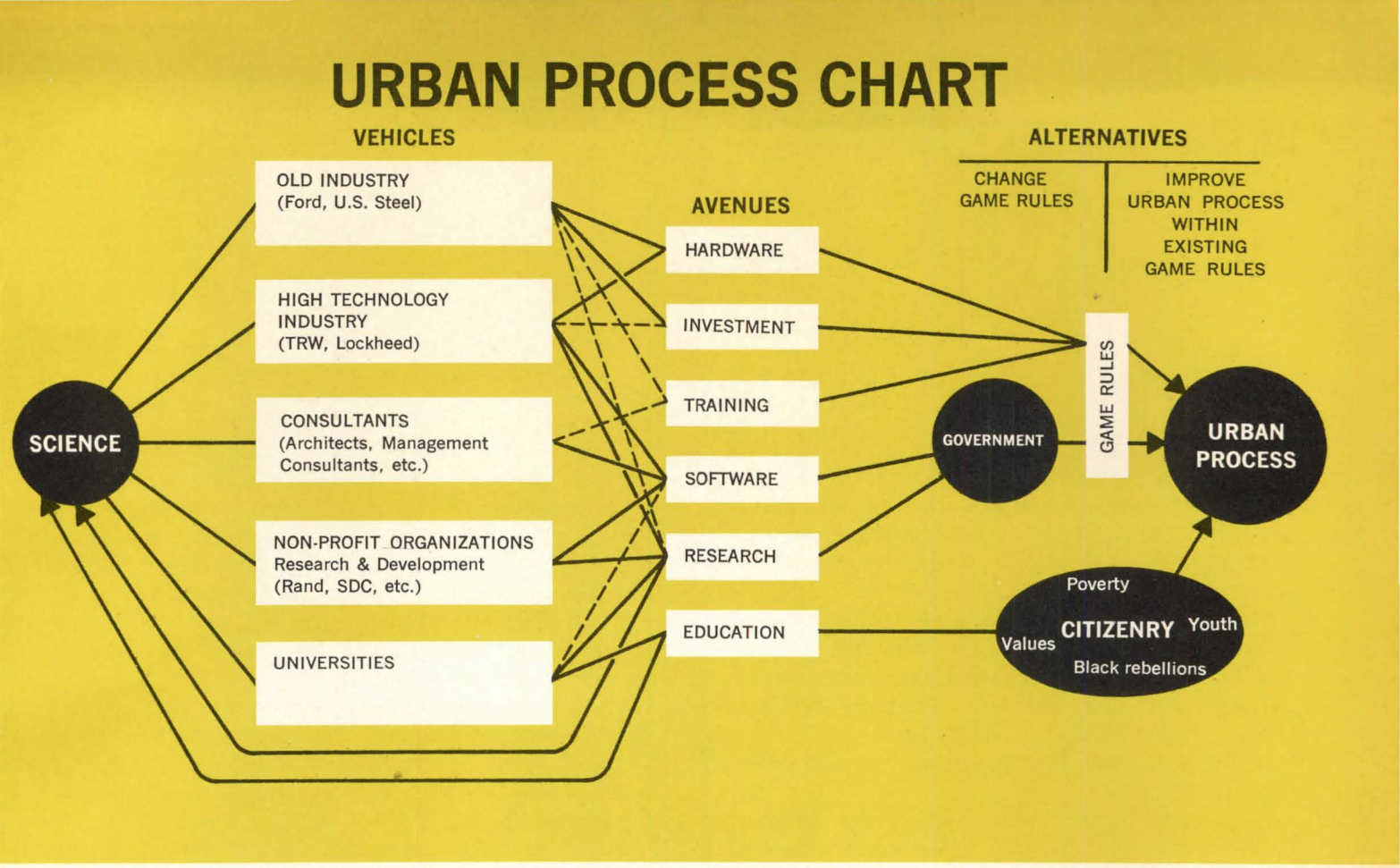
TRW's civil systems business is barely four years old, but it already includes such diverse projects as analysis and planning of a $100-million Canadian health sciences center for the Province of Alberta; a U.S. Department of Transportation contract to study high-speed ground transportation systems for the traffic-clogged Northeast Corridor; and a variety of other projects related to urban redevelopment and community planning, water and land resources, medical facilities, automotive safety and flood control.

Through the addition of the extensive life and environmental sciences research and development capabilities of Hazleton Laboratories, Inc., TRW is now able to provide commercial, industrial, and civil systems customers with an "integrated application of the life and physical sciences."

Restructuring the Urban Process — Frank Hotchkiss, an architect who before joining TRW Systems served as Chief Planner for Victor Gruen Associates for several years, described what he thinks is happening to the older professions as well as the new: It is the complete restructuring of the urban process, due primarily to an exploding urban population, the new high-technology industries created after World War II, and economic events such as industry's growing participation in the governmental process as described in Galbraith's *The New Industrial State.*

Hotchkiss' sketch (see diagram) outlines the "vehicles" that bring about changes in the urban process: the older type of corporation such as Ford Motor Co. and General Motors; high-technology corporations such as TRW; consultants of all types, including architects and management consultants; and so on. It also lists the "avenues" or the products these vehicles create, which in turn change the urban process: education, for example, which is produced primarily by universities, and hardware, produced by large corporations. The Government plays an increasingly large role in determining which of the vehicles and avenues do what to the environment through legislation or executive agencies regulated by Federal, state, and local laws. Other rules that govern what happens to the urban process are found in the social, economic, and political processes that take place within the context of the traditions of the society as a whole.

Hotchkiss views architects, as well as most of the other vehicles, as normally operating within all of these rules, so that their effect on the environment is predictable, and while certain of their projects may bring about small improvements, such as a successful urban renewal project, they are unable to bring



about basic changes in the system. To Hotchkiss — and it was a main reason why he went to work for TRW rather than another architectural firm — the most interesting and challenging work is to attempt to change the basic dynamics of these social and urban forces. At TRW and other systems-oriented firms, the new professionals may be able to do just that.

For example, TRW initiated a study for the Governor of the State of West Virginia on a new concept, the "Rural City Program." It proposes building cities in economically depressed areas of the country and would solve several problems at the same time: overcrowding in urban centers; the poverty of local residents; and the creation of sources of economic strength.

TRW did not wait for West Virginia or the Federal Government to sponsor a study; it went to the Governor, and then to three departments of the Federal Government, and then back to Systems headquarters in Redondo Beach, California, to formulate a program for development of the first Rural City with funds funneled through a State Development Corporation and the Appalachian Regional Commission, a new type of governmental body, which is supported by the 13 states in the region. Initial funds would be provided by HUD, Commerce, Agriculture, the State of West Virginia, and private industry.

Although the new Governor of West Virginia endorses the program, as did his predecessor, and although HUD and Commerce are interested, nothing has actually borne fruit yet. But Hotchkiss is sure it eventually will, because of the many new town developments. In addition, Hotchkiss thinks that, in the next 10 years, national legislation will be enacted that will outline policies governing patterns of urban growth even though the U.S. will be one of the last countries in the world to do it. When that happens, public-private state corporations such as the one proposed by TRW for West Virginia will be created, and their plans, programs, and professional talent will have to come from an interdisciplinary pool, such as the ones provided in firms like TRW and PRC.

Planning for Planning — Another current project Hotchkiss is working on at TRW is a massive preplanning study for Orange County, California, an area of over a million people and 25 cities. TRW terms the project "planning for planning," or a PDP (Program Design Project). Its object is to outline to the county government how it should go about planning activities over the next five to seven years, including preparation of a comprehensive plan. The study has to outline what the function of planning in Orange County should be, and how the county should proceed to structure the planning process, how its structure should relate to larger bodies affecting it such as SCAG (Southern California Association of Governments), the state, the Federal Government, and the 25 cities within the county, and what role citizens would play.

Thus, Hotchkiss and TRW are developing a governmental and administrative structure that will in the future determine not only what is built, and how

transportation patterns and districts will be laid out for the entire county, but also what relation planners and architects will have to their clients (the county), what jobs they will work on, when, and what the budget will be.

No better example of the scope of the new professional's work is to be found, and, whatever it is called, this type of study — pre-planning, pre-design, or planning for planning — is going to proliferate. (TRW competed with DMJM and PRC for the Orange County job, and it has a similar job in Fresno, Calif.)

How would such planning affect the architects? Hotchkiss replies, "I believe that architecture as it is now practiced is going to disappear. But I hope architects don't, because they have a lot to give. They have been trained in problem solving, and putting architects together with the new problem solvers and systems analysts is a productive and necessary thing. Each works with entirely different thought processes, and architects are one of the few professionals trained in *creative* problem solving. That is what is valuable about architects. But I think they should start applying this ability to things totally different from structures — to subsystems and networks. They must do it, and do it with the systems guys, and the two working together could be really beautiful."

High Technology Needs Humanizing — When asked who was going to design buildings in the future, if architecture as it is now practiced disappears, Hotchkiss replied, "The high-technology professionals can optimize a floor plan very nicely using computers; they can figure the way it has to change, and figure what parts are needed and how to put these parts together. Then you have a building. And it may be better, in the sense of being cheaper and more flexible than an architect-designed building. All you will be missing is something that swings visually. But if we go to continuous architecture — buildings that are in a constant process of change, non-classic but more organic — then does it matter what the building looks like? I don't know whether a great creator has to step in and synthesize the whole thing when we have megastructures, prefabs, and buildings whose parts are all product-designed. It is said that the architect has a human orientation, but, after all, so do sociologists, psychologists, and educators, and they are all in this game of designing the new environment. And Marshall McLuhan has given excellent reasons why we cannot apply the old aesthetics to the new environment."

> "I believe that architecture as it is now practiced is going to disappear."

Hotchkiss went on to point out that physical structures actually count very little in the total environment as compared to all the non-physical structures — the governmental system, the organizations of schools, health programs, and so on. Within physical systems, there are natural resources of air, water, soil, vegetation, and mineral extraction. The way these work and are controlled is a key part of the environment, "and architects have nothing to do with these right now. It is an area where we are having the biggest success with our civil systems program at TRW. The manipulation and control of natural resources will expand in the future — into oceanography and agriculture, for instance. The new types can deal very well with these, and they have a major impact on what the urban process is and looks like. Also in the physical environment are what I call the networks — transportation, energy, waste disposal. These influence the urban pattern as much as anything, and the architect does not work very much on these either."

Hotchkiss added another thought: that it is not at all clear today what types of buildings will be required in the future. "What the structures will be depends on whether urban growth is centralized into huge megastructures, and enormous cities, or dispersed, like Los Angeles. *Architects* say that cities should be centralized and high density, but many theoreticians of urban growth, especially the Europeans, are saying that dispersal is better. Of course, if it does concentrate, then the architects will have something to design; but if it disperses, then he has less to design because the new technology can provide trailers or cocoons or plastic bubbles. Complicated structures will not be needed, because, for two or three stories, the prefabs will really work."

PRC Reaches Into New Markets

Planning Research Corporation (PRC) and TRW, Inc., are the two foremost examples of the new kinds of corporations and the new markets for professional services. Together, they gross well over $1 billion annually, and, although the great majority of their contracts do not relate to architectural work, a growing percentage of the work these two publicly owned corporations perform is in direct competition with, or encroaches on, work that might otherwise have gone to large architectural, engineering, or planning firms. Both corporations are less than 30 years old, and, starting from scratch, have grown into mammoth organizations through in-house expansion as well as acquisitions of companies whose proven competence in a certain field has added both professional expertise and sizable financial benefits to the parent companies.

Both PRC and TRW employ staff architects, and TRW recently started an "urban programs" division. Within the industry, people are suggesting that TRW will soon acquire either a planning or an A-E firm to assist the corporation in obtaining contracts for its urban work. PRC has committed itself to what it terms the urban redevelopment field, and, in March 1969, acquired Frederic R. Harris Inc., the fifth largest professional design firm in the U.S. Harris performs planning, design, engineering and construction management services. In February, PRC had acquired two large engineering organizations: Quinton Engineers Ltd., an A-E firm, and Budlong & Associates, mechanical and electrical engineering consultants. With a combined annual income of more than $5 million and 220 employees, the two firms were merged to form Quinton-Budlong Associates, a wholly owned subsidiary of PRC. The merged firm thus became one of the larger A-E firms in the U.S. Like PRC, Quinton and Budlong are based in Los Angeles.

Dr. Robert W. Krueger, the president of PRC, made a statement about the merger and the reasoning behind it that is of interest to architects: "The parent company, with its subsidiaries, will be able to take a project from inception to completion, offering every service from the initial feasibility study up to the onset of construction and, in some cases, including the management of construction."

> "Complicated structures will not be needed, because . . . the prefabs will really work."

Non-Profit Into Big Money — PRC was created in 1954 when Robert Krueger, a physicist, and Stuart Krieger, an aeronautical engineer, left the Rand Corporation, a nonprofit research organization, to set up the new company. Within six months, they hired three more Rand scientists and engineers with extensive experience in systems analysis. The first contract the new firm obtained was with RCA to assist in deciding which of four or five missile projects it should work on. The bulk of PRC's first contracts were for logistics supply control through computer techniques. The next major direction of PRC contracts was for the analysis of organizational structures, again with the aid of computers. The majority of PRC's work is still in these types of projects, as the accompanying chart of PRC divisions and subsidiaries shows. When PRC "went public" about five years ago, it did so to acquire the capital necessary to finance the corporation's growth. In particular, PRC had set as a "general goal for the future the attainment of all professional skills needed to assess a problem area so that, with the systems analysis approach, we can make important contributions to solutions of problems. Such complete professional services we call 'turnkey' professional services." By becoming a publicly held corporation, PRC was able to approach its goal with the expansion capital obtained from stock issues.

One of the many professional service markets PRC will penetrate as it expands is "total development." Dr. Krueger said, "This includes all the professional services preceding (and including the direction of) construction of large projects. Financial feasibility studies, economic analyses, and systems analyses form a general framework. There is architectural and engineering work, and there is systems management — the technical direction of a project. The applications are in resource development and, of course, in construction of somewhat more mundane things

such as buildings." There is a striking similarity between this definition of a turnkey professional service in the "total development" area and comprehensive architectural services as defined by the AIA in 1967.

PRC is in many ways an exciting realization of the comprehensive services concept. Although PRC has not yet acquired a major architectural design firm, it would be logical to assume that PRC might soon round out its team with a first-class architect such as the Ogden Corporation did with Charles Luckman Associates. The eight other professional firms acquired by PRC in the past few years are a strong indication that PRC is heading in that direction. P/A reports on just three of them:

Transportation and Sociology — Alan M. Voorhees & Associates, Inc., was organized by an urban transportation planner, Alan M. Voorhees, who was recently elected to the presidency of the American Institute of Planners. Transportation planning is the firm's specialty, and about 75 per cent of its work ($4 million gross revenues) is in this field. Voorhees is also interested in general urban planning and its practice has been heavily oriented toward the computer sciences. Recent Voorhees projects include the design of a battery of computer programs for HUD's transit planners, comprehensive transportation planning for several new towns, the traffic engineering phase of the Lower Manhattan Plan, and a computer simulation model of the Atlanta and the Dallas-Fort Worth airports.

R. Dixon Speas Associates, Inc., and Aero Performance, Inc., a related subsidiary, are primarily concerned with airline transportation, airport planning, general aviation scheduling and control, and aircraft product analysis. Their clients include airlines, airport operators, government agencies, and aircraft and equipment manufacturers. Recently they have produced a variety of studies: a master plan for the Winnipeg International Airport (one of eight similar studies); an automated cargo documentation system now in operation by Swissair; computerized flight planning of Pacific flight routes; and a simulation model of present and future airport and air traffic flows. The Speas group also performs the route selection services for 45 per cent of all jet aircraft flying the North Atlantic.

"Our objective is to make Harris the dominant firm in the U.S. and abroad . . ."

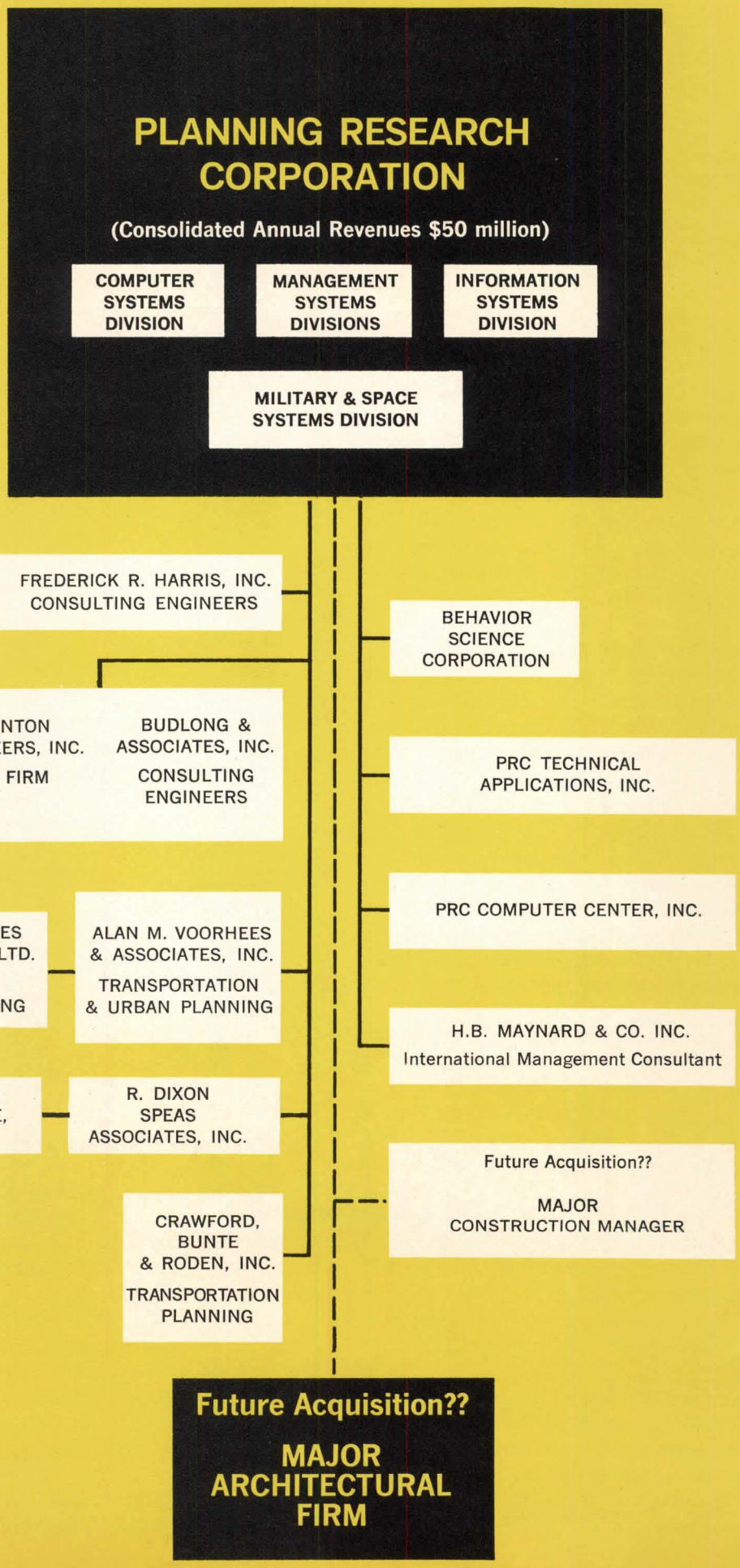
The acquisition of the Behavior Science Corporation in 1967 was viewed as a pooling of similar interests. BSC is an organization of sociologists, psychologists, and political scientists whose disciplines are applied to "the solution of the 'socio' part of the socio-techno-economic problems" handled by PRC. Behavior Science has been involved in a wide variety of studies, including an investigation of what factors inhibit many people from air travel, executive selection, and a survey of current practices in psychiatric consultation in communities, advertising, market research, land use surveys, and an evaluation of new curriculum practice in a primary school district. Clients of BSC include the National Institute of Mental Health, the City of St. Louis, and the Federal Departments of the Army and Labor.

Engineers Add $11 Million Annually — Shortly after PRC acquired the newly formed Quinton-Budlong group, it acquired F. R. Harris, Inc., of New York City, one of the largest consulting engineers in the world, with $11 million in annual income. With the addition of the Harris firm, the size of the Planning Research Corporation staff increased from 1600 to 3100 in more than 101 worldwide offices.

In announcing this latest acquisition, Mr. Edward J. Quirin, president of Harris, remarked, "Our objective has been to make Harris the dominant firm in the U.S. and abroad providing industry and government with planning, design, engineering and construction management services. With the financial support of Planning Research Corporation and the technical support of the parent company and its subsidiaries, we are confident we can achieve this objective much more rapidly than we could have alone."

Frederic R. Harris, Inc., has been involved in many phases of consulting engineering, with special com-

DIVERSIFIED SUPPORT HELPS WIN CONTRACTS AT PRC



petence in highways, bridges, airports, tunnels, rapid transit, major port and shipbuilding facilities and petroleum industry facilities. Recent projects include the Gulf Oil's world-wide terminal network for mammoth tankers, the Belgium E-3 Thruway system, a future development study for the Greater Delta region of Holland, subway system extension designs for Buenos Aires, Antwerp, and Brussels, and a statewide airport facilities study for Connecticut.

From Pre-School to Post Industrial — In addition to these recent acquisitions, the Planning Research Corporation also has four in-house divisions, which spend 70 per cent of their efforts on military contracts. But these divisions have also executed projects that range from an analysis of the Head Start program to a cost effectiveness study of the Washington, D.C., traffic signal system; from a management information system for a major stock brokerage house to a river basin development plan; from the design of police and fire warning systems to studies of credit and capital formation in underdeveloped countries; from economic studies of nuclear-powered desalination stations to industrial base analyses.

PRC stands as an example to the professional in architecture. For one thing, it should be obvious that if PRC represents the wave of the future, the architect will very likely remain simply one part of a rather large professional team creating "man's total environment," and very likely he will not be the leader, at least not in the early crucial stages of environmental planning. For another, if PRC can assemble such a formidable team in a relatively short period of time, and build in 14 years a $50 million corporation whose sole "product" is professional services, then it is likely that other similar organizations will develop to compete with them as well as with traditional architectural firms.

Finally, one cannot help wonder if perhaps architectural offices should forget about becoming multidisciplinary and concentrate instead on becoming the best possible *physical* designer of construction documents — that is, to remain a specialized yet effective traditional architect within a team of specialists.

WHAT IS A "PROFESSIONAL"?

Most people have a reasonable idea of the meaning of a professional: He is an expert who helps other people solve their problems. Moreover, the term generally suggests a code of ethics requiring the professional to act in the best interests of his client.

These ideas were summarized by a British sociologist, Gurth W. Higgins, who was commissioned to study the subject of professionalism for the Royal Institute of British Architects. In one of the few recent articles on the subject, he wrote: "A professional is a person expert in some field of activity who shares the responsibility for decisions, and gives a service to others in that part of their affairs to which the professional's expertise applies, bringing to bear in this participation wider values than those whom he is advising may necessarily themselves consider relevant, **i.e.,** supra-client values.

"The tradesman will expect to be told what he is to do. . . . The professional, on the other hand, will participate in his client's decision, and will share the responsibility for the satisfaction or dissatisfaction the client experiences from it. We do not, for example, tell our lawyer, our accountant, or our doctor what he is to do; we will tell him about our problem and commission him to act for us.

"Individuals will not, of course, permit the degree of intrusion and control over their private affairs that the professonal relationship calls for, no matter how much they need this assistance, unless they are assured of two things: first, that the professional is sufficiently competent in his claimed field of practice; and, second, that there is some guarantee to the client that in allowing the professional to share in decisions on his behalf, the professional will be guided by his [the client's] best interests."

Very similar principles were expressed recently in

Government Stimulates Research

The Federal Government annually spends about $3 billion on research and development. The estimated non-defense portion of this is about $1 billion. In addition, corporations spend about $2 billion of their own money on R & D.

The recipients of government largesse are universities, nonprofit research firms such as the Rand Corporation, and other research, computer software, management consulting, and systems analysis firms (see AUGUST 1967 P/A), some of which are publicly owned and some with ownership residing in top management.

Typically, these organizations are multi-disciplinary groups of professionals who work in teams. The

the March/April 1966 issue of the **Harvard Business Review** by Warren J. Wittreich. The author advised buyers and sellers of services to keep in mind three basic concepts:

"(1) Minimizing uncertainty. A professional service must make a direct contribution to the reduction of the uncertainties involved in managing a business. The proper assessment of a service, unlike tangible goods, usually must take into account the impact of its performance on the client's business.

"(2) Understanding problems. A professional service must come directly to grips with a fundamental problem of the business purchasing that service. The successful performance of the service, far more so than the successful production of a product, depends on an understanding of the client's business.

"(3) Buying the professional. A professional service can only be purchased meaningfully from someone who is capable of rendering the service. Selling *ability and personality* by themselves are meaningless."

These guidelines can be quite helpful in defining the role of a professional in the building industry, whether or not we distinguish among professionals with more specific labels such as market analyst, systems engineer, realtor, architect, or construction manager. The market analyst who prepares a feasibility study for an office building, and the construction manager who plans and controls the building contractors' schedules, can be as much a "professional" as an architect. Each is bringing his expertise to bear on some problem of the client and thus minimizing the uncertainties in the process of creating the office building.

It therefore becomes apparent, when using the above guidelines, that there are many professionals involved in the creative process of building construction, not the least of which may be the mortgage banker who was able to develop the financial deal that made the project possible.

This raises an interesting question for architects about the reciprocity of professional privileges. We accept the fact that an economist, mortgage banker, or construction manager cannot practice architecture partly because he is not licensed to do so, but equally so because he is not an expert in the design of construction documents. But the Comprehensive Architectural Services philosophy implies than an architect should serve as, say, a professional economist, or have one on his staff. However, as a designer of construction documents, the architect has an inherent bias that tends to assume that the solution to all client problems is a physical building. And, since these solutions are responsible for his income, the bigger the building, the better off the architect will be. The economist, on the other hand, must always leave open the alternative solution that no building should be built, and he is paid for his expertise independent of his solutions.

This is not to imply that the architect-economist will be unable to present an objective economic appraisal of the situation because he will also want the design commission. It does suggest, however, that a conflict is more likely than when the economist and architect are separate consultants.

Carried one step further, the same line of reasoning might be applied to the entire comprehensive services philosophy. Should an architect avoid creating potential conflicts of interest by pretending expertise in areas where, at most, he has cursory knowledge of the subject, and, is he in a conflict situation even if he is a multidisciplinary expert in the building process.

Perhaps all this discussion is irrelevant, since in the end it will not be the fine lines one or the other professional will draw around his territory that will lead to the success of a professional. Rather, it is the client, or, more exactly, the market place, comprising a stream of clients, who must be satisfied that the professional did in fact help solve his problem. To the client, academic discussions about the meaning of "professional" are relatively meaningless; he wants results. — P.B.F.

range of problems they contract to solve is almost limitless and seems to get wider all the time. And, increasingly, the work these organizations and the professionals in them perform will influence the environment for millions of people.

The Rand Corporation is currently involved in New York City in six different programs in the Housing, Police, Fire, and Health, and manpower and education training programs using systems techniques. They also have a research contract to study the relationship of the urban resident to the various service agencies above.

On the West Coast, Stanford Research Institute completed a comprehensive study on economic development for the city of Oakland, California. The Logistical Research Division worked on an exhaustive study for HUD on futuristic transportation concepts that included recommendations and considerations of land use. SRI is also working on a multi-client housing program in which a group of clients are seeking to develop the new town of Jonathan, Minnesota.

The First Research Corp. performs economic feasibility studies for new shopping centers. Its services include recommendations on location, optimum size and mix, initial timing and expansion schedules, estimated sales for each type of outlet.

FRC makes similar studies for apartment buildings to recommend the type of tenancy, number of units, optimum mix of apartment sizes, size of units, price ranges, ancillary facilities to be provided, type of financing, and the best timing for development to start.

With expertise in commerce and housing, FRC moves easily into hotels, motels, recreation and residential development. This again includes a "determination of the number of dwellings, optimum price ranges, types and sizes of houses, and ancillary facilities." It also makes land use analyses of three kinds: "optimum or highest and best use," "redevelopment and/or re-use," and "downtown revitalization."

Research firms often locate close to universities because of the large pool of available talent. Abt Associates, Inc., is no exception; the Cambridge, Mass., firm is currently under contract to the AIA to study the future of the profession; Abt bills itself as "a company that solves problems for industry, education, and government." Its brochure catalogues an astonishingly comprehensive list of services. Operations research and cost-benefit analyses of industrial, educational, and administrative processes; economic and statistical analysis for transportation, housing, economic development; social science and systems research in education, labor and management relations, health, welfare, transportation, and international relations; planning for schools, transportation systems, hospitals, industries, companies, cities, and regions, and program development in education, training, health, welfare, and urban growth.

Abt's work has its lighter side, as is evidenced in its development of the game SIMPOLIS (designed for and played at the Design-In in New York in 1967), which is a "simulation of the urban crises in transportation, pollution, anti-poverty, crime control, housing, education, and economic development."

Schools Seek Pre-Design Services

Of growing importance among the "new professionals" are university-based organizations that seek research contracts from corporations and government agencies. Many of them specialize in what Robert Hastings, president of Smith, Hinchman & Grylls, terms "pre-design" services. One example is Systems Analysis & Design Optimization, Inc., an organization of professors at Louisiana State University who are from diverse fields, including architecture, sociology, business administration, educational psychology, and civil engineering. SADO offers the following services, among others: "architectural and planning systems, computer analysis, management systems and market analysis, operations research, simulation, and structural, mechanical, and electrical systems."

Another example is The Institute for Architecture and Urban Studies. An independent educational corporation chartered in 1967 by the State University of New York, the institute was founded by Cornell University and The Museum of Modern Art in New York City. One of its goals is to combine the resources of the museum, the university, and public and private agencies. The institute will offer a three-part program, consisting of a "design education closely integrated with the planning and development of actual projects," an applied research program, "which will function as a consulting service to public and private agencies," and a program of pure research, "which will develop a conceptual framework to define the role of physical planning and urban design in the total planning process." The faculty so far consists of two architects who have specialized in urban design, and a sociologist.

Financiers Sell Progressive Design

On big real estate projects, it is more likely that the architect will be brought into the financial planning in its earliest stages. Edmund J. McRickard, president of Real Estate Board of New York and partner of Brooks, Harvey & Co., which has arranged financing for many of the country's largest projects, says that the increasing involvement of architects in putting together a permanent financing package is dictated by the complexity of today's multimillion dollar deals.

"It is our experience that when everyone concerned — developer, architect, contractor, lawyer and financial planner — work together from the beginning, better permanent financing results," McRickard says.

He points out that the demand for equity participation by lending institutions is now a feature of most large-scale real estate financing. This, in effect, makes the lender a partner in the venture and adds an as-yet-unseen second client the architect must satisfy.

"Lending institutions vary in their receptiveness to various forms of real estate," says McRickard. "The solidity, feasibility and appeal of the final financial package must be designed as carefully as the leasehold structures."

Designing a building without regard for permanent loan placement is almost like designing without regard to function, says McRickard.

He also says that far from being natural enemies of good architectural design, financiers are often supporters of innovation. Because of their broad na-

The architect will no longer be the large client's sole "agent" or the leader of a team.

tional experience, they are more likely than developers to see the value of new uses of space and material. A firm with years of experience in presenting a financial package to lenders is best qualified to sell progressive design to institutions because its judgment is trusted.

McRickard believes that a basic understanding of the techniques of real estate financing is a necessary element of the architect's qualifications, just as an understanding of design and construction problems is essential to sound financial planning.

"The architect should know very early what restrictions and opportunities are afforded him under the probable permanent financing arrangements," says McRickard.

"Unless the architect understands the reasons for design and cost parameters imposed by financing, he may be frustrated by what may seem to him stupid and unnecessary conditions."

To illustrate the sophistication of today's real estate financing, he cited the example of a retail-commercial-dwelling complex. To accomplish maximum financing, it will be necessary to separate various interests, such as leasehold, freehold, and air rights. The architectural form will not only follow function, but will also bear a strong resemblance to the structure of the financing.

Another member of Brooks, Harvey & Co., Glen McHugh, a retired vice-president in real estate investment for Equitable Life Assurance, gives a further conclusion: "Unfortunately, it is the smaller projects where it is the exception rather than the rule for the architect to be put into the financing picture at the outset.

"If, as is often the case, the developer lacks experience in arranging permanent financing and finds himself unable to realize the full potential of his deal, the blame unfairly falls on the architect. It is essential in cases like these for the architect to understand the requirements imposed by financing and to keep them in mind in his design."

There is a practical way to acquire this understanding. McHugh advises architects venturing time and talent on preliminary designs to seek out the advice of competent brokers who will venture their time and expertise to counsel with them on the feasibility of their plans from a financing standpoint.

Two More Influences — Two other types of organizations influence urban environments as well as the design and construction of individual buildings: real estate research and finance. One firm, Development Research Associates, competes directly with large A-E firms for research and feasability reports, and another, Brooks, Harvey & Co., financiers, has stated that architectural design and the probability of a project getting built can both be improved by both professions — real estate economists and architects — cooperating at a very early stage of the project.

As in other areas of research in connection with this issue of P/A, it looks as though the entry of the new clients, the new professionals, and the unprecedented scale of many new building projects, will radically change the architect's relationship with real estate experts of all types in the next few years. And, once again, indications are that the architect will no longer be the large client's sole "agent" or the leader of a team, but a professional whose staff must include other professionals who can cooperate with other consultants on the early stages of large projects.

Economics Overlaps Architecture

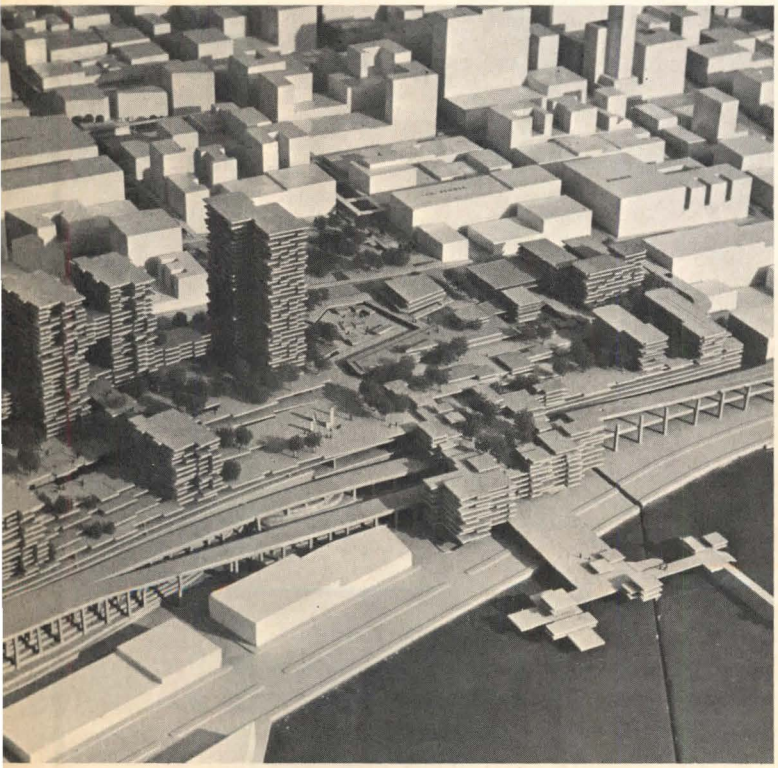
"The seeds of mistrust between the architectural and economic disciplines have long been germinating. . . . There appear to be three reasons: a lack of respect between the disciplines; a lack of interprofessional knowledge; and poor client coordination."

Development Research Associates, whose 31-year-old president, John W. McMahan, wrote the above in an article titled "The Architect and the Economist," is a new kind of economic research organization that, in its six-year life, has already completed more than 500 professional assignments and has grown to 651 employees. Development Research's clients are similar to those of the other new professionals: corporations, landowners, developers, financial institutions, governmental agencies, and architects. Among the services the firm offers are property appraisal, financial analysis, market research, corporate consultation, economic forecasting, and feasability studies.

In some instances, DRA is called in by a client who owns land and wants to find out the best use he can

make of it, whether he should build on it and, if so, how to manage the project, when to bring in a developer, and what the unit mixture should be. If office buildings seem called for by the economic analysis, Development Research will recommend suite sizes, define the market, appraise the property, and develop both a financing program and a marketing program.

In other instances, clients who want to both buy and develop land hire DRA to perform site selection studies, as well as the other services listed above. As McMahan indicates, he is aware that the two professions — architecture and economics — overlap on projects and he feels that each has its own place. For example, he thinks that in many cases the economist should determine unit mix and size, project phasing, and parking requirements. But what is most interesting to architects is the extent to which the economic studies performed by Development Research may influence total environments.



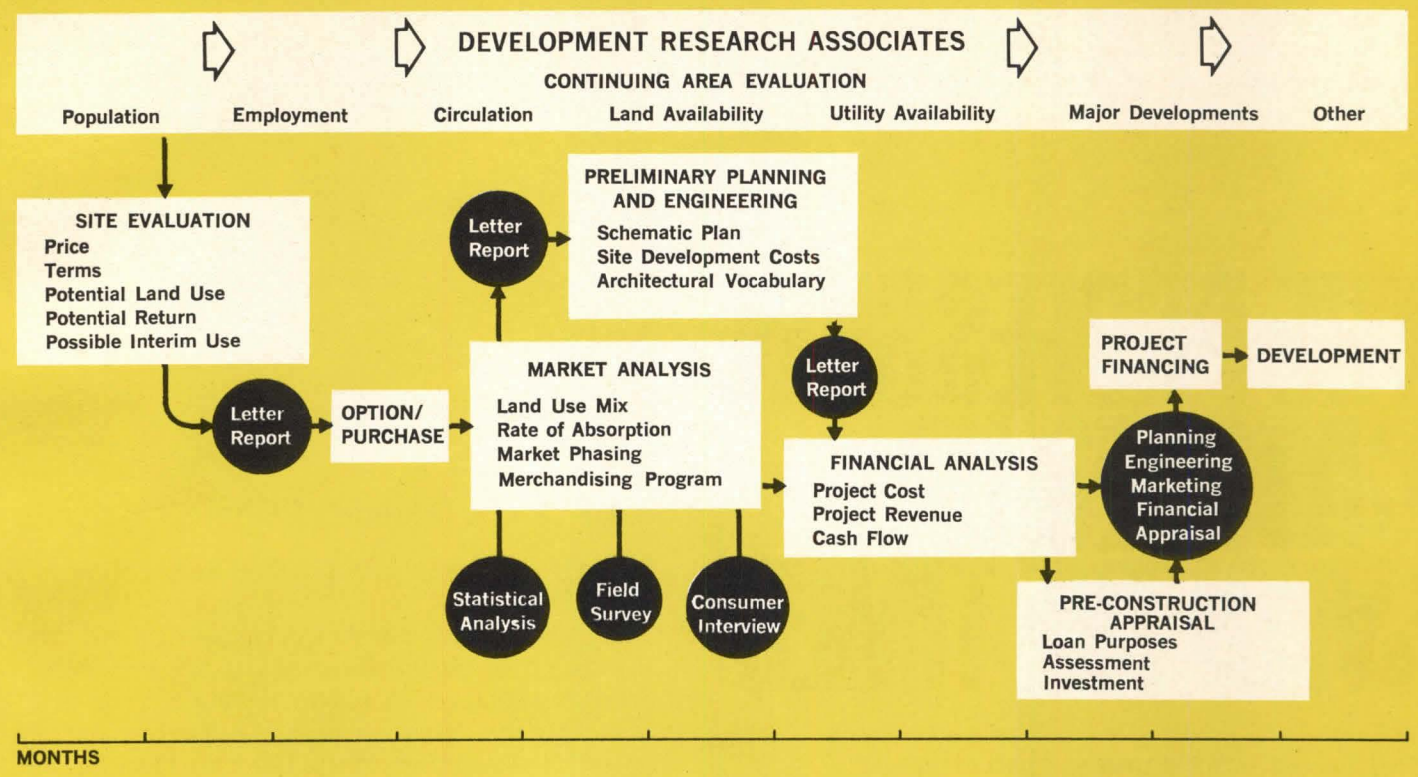
Pike Plaza Redevelopment Project in Seattle, Washington, designed in joint venture by architects John Morse & Associates and Kirk, Wallace, McKinley & Associates, with DRA as economic consultant.

Don't Forget the Economists — In a study for the City of Hayward, California, DRA economists played a role equal in importance to that of architects on the same team. The study examined the impact of the Bay Area Rapid Transit System (BART), what the city's long-range objectives should be, what alternative urban design and development routes the city could pursue, and a program for achieving each alternative. DRA played a major role in writing the final report for the other two members of the research team: the Advance Planning Section of the City Planning Department and Okamoto/Liskamm, architects and planners of San Francisco.

Similarly, DRA recommended to the City of Seattle that the Pike Plaza Project should include new apartment buildings aimed at the middle- and upper-income levels, that a "Class A" hotel be included in the site development, that no major office buildings be constructed on the site, and that the Seattle Public Market be retained because of its "atmosphere" and the "personal attributes of the merchants." A final recommendation is that the project be sold to a single developer because of the complexities of arranging for building on air rights. Thus the report is a comprehensive market and economic research study that influence building types, sizes, quality, and the over-all atmosphere of a large part of a major U.S. city.

Planning to the Last Detail — Often, however, Development Research's recommendations go even further, to the point where planning and urban design decisions are formulated on the basis of economic criteria. An example of this is a market feasibility study done for Lomas Santa Fe, a large tract of land near San Diego. In the section of its report to the owner titled "Recommended Marketing Program," DRA spells out exactly what should be done with the land under study: "We believe certain basic marketing concepts should underlie planning, architectural, engineering and merchandising activity." These "concepts" include: "interlocking of demand" (creating many different types of projects at the same time); development of a "ricochet" market, where small projects are merchandised around a larger, stronger project that serves as a magnet to attract prospective buyers and shoppers"; "Retirement First, Suburban, Second"; and maintenance of a

How DRA plans a project development program



strong "quality image." The report goes on to outline specific land uses: residential, including number of bedrooms, number of units, size of units in sq ft, lot sizes, and "features" that include specialty rooms, view orientation, 18-hole golf course, clubhouse, greenbelt areas linking homes and golf course, and price ranges.

All of these specifications are also outlined for low-, medium- and high-density residential land uses; retail commercial facilities are proposed, including recommendations as to how much floor area should be provided for each facility (supermarket, bakery, gift shops, laundromats, and so on); how much rental each owner would pay, and what sort of institutional land use should be assigned. In the section titled "Utilization of Individual Parcels," DRA states: "Although the selection of parcels for particular uses is basically a planning function, there are certain economic considerations that make one site better than another for a particular use." And DRA proceeds to recommend for each site a specific mix of land uses.

But real estate research and analysis is only half of DRA's work; like other new professionals, the young company (average staff member age: 30) has begun to expand its markets. It is now looking to acquire a computer software firm to increase its ability to handle complex client problems. A recently added division is a management service to help new black businesses in cities. DRA is also working on a study of the salinity of the Salton Sea for the State of California, since the waters are being ruined slowly by a growing salt content. Another study is for the City of Tucson, Arizona, on "the form of the city" 20 years from now. DRA is also involved in the Bunker Hill urban renewal redevelopment project in Los Angeles, one of the largest projects in the country. Many of these contracts could have been won by architectural firms had they added economists or sociologists to their staff.



THE PROFESSION CATCHES UP WITH THE TIMES

Small architectural offices form mergers and large A-E firms offer a wider range of professional services to meet the challenge of consulting engineers and package builders entering architecture.

Although some observers and members of the professions predict the ultimate demise of architectural practice, indications are that *all* of the established professions — law, medicine, engineering, and architecture, among the most obvious cases — will at least undergo basic changes, both in relation to potential markets for professional services (the "new clients") and competition from the "new professionals." Outside pressures on the old professions come both from new technologies and changes in the social, economic, and political order, as well as from practitioners. As the recent history of the AIA indicates, the profession is already in the throes of change, and the situation is likely to get worse before it gets better.

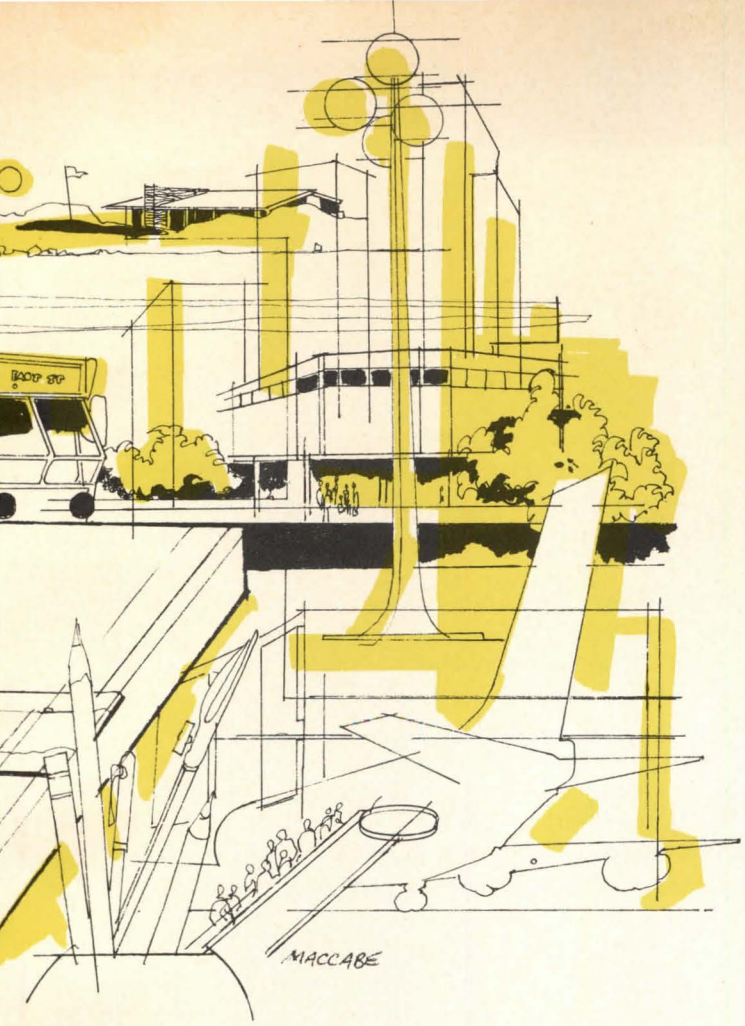
The AIA and a Decade of Chaos

By Paul Farrell, a graduate architect and lawyer.

For the past 12 years, the American Institute of Architects has been in the forefront of the architects' unsuccessful struggle to redefine their role as professionals in the "creation of man's environment." Since 1957, the reactions of the Institute have passed through several phases: initially defensive against the intrusions of the package builder; then presumptiously proclaiming the architect as the recreation of the Rennaisance "master builder"; and, finally, apologetic, withdrawn, and confused as everyone condemned this arrogance, and the architects themselves began recognizing the tragedy of their inability to compete effectively in the marketplace for comprehensive planning and construction services.

During this 12-year drama, the AIA has on occasion attempted to lead. But more often than not it has been a tardy reactor to the pressures of its more vocal members, who were often motivated by their loss of commissions. In either case, the Institute's reactions, which are promulgated by the studies made by the committees it creates, present an interesting reflection of the ambiguous, insecure, and relatively minor role that today's architects play in the total real estate and construction industry.

The world appears to be rapidly passing by most architects, who are dropping further behind the realities of contemporary management science and



technology. Today, many other professionals and businessmen continue to expand their already enormous influence over the process of creating architecture while many architects still narrowly view "comprehensive services" as, say, a choice between providing or not providing soil borings. In other words, the average AIA member nestled in a small firm or submerged in a big one, is relatively unaware of the broader context of the new creative forces in architecture.

Given this myopia, it is quite understandable that the AIA itself is confused about the role of the architect. Yet, as with any vanishing breed, there may be nothing the AIA or anyone else can do except preserve a few quaint reminders of the past. As a representative body, the AIA is in a dilemma, since it includes both the many small architectural firms and a relatively few, large multidisciplined professional organizations. The differences are so great as to suggest that the AIA will probably never pull out of its current problems until it formally splits into two groups: one for the small firms, and another for the larger ones who are beginning to develop the capability of competing in the larger environment described in this issue. Until then, it is unlikely that the AIA will be able to develop a realistic role for the architect.

The Package Dealer: A Convenient Villain — The inadequacies of the traditional role of the architect as a physical designer of a building became increasingly apparent in the 1950's. During the decade of 1950 to 1960, package-dealers — firms with integrated, single-responsibility engineering design and construction management capabilities — began competing successfully against architects for a larger number of commissions. When architects felt the loss of commissions, those most directly affected (primarily those involved in industrial facilities) began pressuring the AIA to act.

In August 1957, the AIA created a Package Deal Committee to study "the problem" and thus initiated a chain of events leading to today's confusion. The following February, the committee recommended that the AIA inform its members about the package builders' unethical practices of combining design and construction, and that it should alert the architect to the need for expanding his professional services to make him competitive within the construction industry.

The problem of expanding the architects' services was commented on by one committeeman, Vincent Kling, in the *Florida Architect*, February 1959: "The history of our profession in America makes us realize that the educational system by which the architect is prepared, and the licensing laws by which he is permitted to practice, do not place him in a position of master builder." Yet Kling also observed, "We architects are the only ones who can supply leadership for the building industry." The gap here between reality and publicly expressed desire to control the process of creating architecture was to become a major source of the architectural profession's problems for the next decade.

A couple years after the Package Deal Committee disbanded, the AIA created a Committee on Commerce and Industry, whose functions included acting as a clearing house for information about the package dealer; publishing occasional articles lauding the architect's multidisciplined capabilities (reprints of which were sent to America's leading businessmen); and analysis of specific case studies on ethics relative to the package deal problem. The significance of this committee's eight-year tenure is that it has provided a minor forum for those architects most directly affected economically by package builders.

The Master Builder Returns to Save the World from the Package Dealer — The AIA officially created the important "Committee on the Profession" in November 1957. Initially, its main objective was "to provide the profession with the first steps of a solution to the package deal problem," which is quite in line with the AIA's general preoccupations. It took a much less defensive approach than the Package Deal Committee and set out to define a "bold, new" philosophy for the architect.

This philosophy was interpreted by *House and Home* magazine in April 1962, in an article noting that the new AIA officers "want to position the architect as the key member of the building team." The

article boldly stated, "Nothing less than a new definition of the architect and his profession was at issue." The new role the AIA saw for the architect was implicit in two basic goals developed by its leadership:

■ "To expand the services of the architect so he can regain his ancient role of the master-builder who coordinates all phases . . . of planning and building.

■ "To fulfill the profession's responsibility to the public by taking the lead in saving America from ugliness, from urban blight, and from urban sprawl.

"These two goals add up . . . to this: The profession must assume responsibility for nothing less than shaping our total physical environment in harmony with the aspirations of man."

The "bold, new" philosophy, called "Challenges," a mixture of the master builder concept and the "comprehensive services" concept, was published in the *AIA Journal* in June 1960 and April 1962. These issues were appropriately called the "blue blasts" because of the color of the paper and tone of the recommendations. Unfortunately, shortly after the committee completed its work, its public announcement that the architect was the "leader of the industry" was quickly shown to be out of step with the times. For one thing, the systems philosophy emphasizing an interdisciplinary team approach was becoming popular. For another, the general contractors and other design professionals balked at the architects' quixotic arrogance.

One of the main concerns of the committee was the need to clarify the Standards of Professional Practice and make explicit that the agency concept did not prohibit an architect from becoming involved in nontraditional services, including the management of construction activities without becoming an "independent contractor" and creating an unethical conflict of interest. The standards were subsequently modified for this purpose. But the distinction between agents and independent contractors has never been an adequate dividing line between professionals and nonprofessionals, and as a result it tends to be a useless guideline for distinguishing architects from nonarchitects (see box, p. 138).

The Committee's Second Report, "Directions," April 1962, introduced the term "comprehensive architectural services." The committee expressly noted that "the architect must become more involved in programming, real estate, promotion, finance, and managerial services for the client; he must use his broad planning and organizational skills to perform and coordinate the client's *total building needs*."

Thus, as recently as seven years ago, the profession formally recognized the need to offer services other than traditional physical design services.

"General contractors and other design professionals balked at the architects' quixotic arrogance."

Re-educate the Architect — Although the Committee on the Profession was disbanded in December 1962, it started in motion a number of other Institute activities, particularly in education. Continuing education became popular in 1962 and 1963, when the Institute sponsored dozens of regional seminars to explain the comprehensive services philosophy. The *AIA Journal* also assisted by publishing a series of 36 articles defining comprehensive architectural services; these articles were published in book form in 1965.

In September 1965, the AIA retained Princeton University to study in greater depth the educational recommendations made by the earlier committees. Unfortunately, neither the AIA nor Princeton had a clear understanding of the purpose of this research. The original objective of the project was "the development of a flexible framework for diversity among students and schools, including a process for curricula change and evolution." This they hoped to achieve through "broad scale participation in this process by both the schools and professionals involved in environmental design."

But when the Princeton Project was finally submitted to the AIA in 1968, it proved to be little more than a graphic restatement of the comprehensive services philosophy within the general framework of a series of degree and nondegree courses. Furthermore, the Princeton Report recommended *additional* research to develop (1) curricula, (2) teaching aids, (3) program evaluation procedures, (4) teacher development programs, (5) nonprofessional educational programs, and (6) continuing education programs for architects. The reaction to the report was almost violent.

The Reaction to the AIA's Direction — One of the most curious phenomena in the development of the CAS philosophy is the Institute's failure to seek outside advice before announcing that the architect was the new master builder; apparently the patient was confident that he could cure himself of the package deal problem.

As early as 1961, the Committee on the Profession had informally recognized that it lacked definitive studies analyzing two key issues: the present and future markets for client services, and the problems

and opportunities of our society over the next 40 years. Yet the AIA chose to rely on intuition and experience as a basis for developing the comprehensive services philosophy for the professional architect. Until very recently, this unscientific romanticism has been one of the architect's biggest pitfalls.

Unfortunately, the grand scheme began to fall apart very soon after being promoted. The Association of General Contractors (AGC) and several professional associations each extracted concessions from the AIA that amounted to a retraction of the "leader of the design and building process" philosophy. In addition, the architect found himself facing a developing army of competitors, many of whom would not fit in the category of the traditional unethical villain — the unprofessional package dealer.

In 1963, shortly after the Committee on the Profession delivered its second report outlining the CAS philosophy, the AGC and the AIA established a Liaison Committee, which recommended that the architect and the contractor serve together on projects in a "team approach."

One interpretation of the official recommendation is that the small building contractors (the AGC, like the AIA, represents relatively small organizations) were also afraid of the success of the package dealer and preferred a neat division of labor between design and construction. In any event, while the AIA's national board of directors took no official action on the team approach recommendation of the AIA-AGC Liaison Committee, it was clear that the contractors had no intention of becoming subservient to the architect, and that the architects themselves were not completely convinced that they could perform the role of "the leader of the building industry." In 1966, the AIA was forced into a similar compromise by professional associations, including the Consulting Engineers Council and the American Institute of Planners.

It is doubtful that the master builder concept was essential to the development of the comprehensive services philosophy. Moreover, it is doubtful that the Committee on the Profession intended to make the architects appear as arrogant as their blue blasts indicated. Yet that is what happened.

Even if the Committee on the Profession had avoided the naive assumption of the master builder's role — a role which clearly was out of line with the existing skills of the architect and the increasing complexities of the planning, design, and construction process — it is unlikely that they would have recognized the enormous difficulties of re-educating the architectural profession to prepare it for all the many services described in the CAS framework. Furthermore, it is obvious even today that most architects are grossly unaware of the enormous capabilities other professionals, nonprofessionals and business organizations have already developed in the areas the architect intends to expand his services. Elsewhere in this issue are illustrations of this expansion of nonarchitects into the traditional and nontraditional areas of architectural services.

Retrenchment, Confusion, and More Studies — The psychological wound created by the combined failure of others to accept the architect's self-serving role as the master builder, and the architect's realization of his limited skills in a highly competitive market place for planning, finance, engineering, construction and management skills, has produced a present mood of cautious, confused indirection at the AIA. At the same time, a few individual architectural firms, notably the larger ones, have been developing much broader practices based on the CAS philosophy. They have done this, naturally, to stay competitive in the marketplace. Most architects (80 per cent of the AIA membership), however, practice in firms of four men or less and cannot afford the luxury of attempting to be "all things to all men." They recognize that the CAS philosophy must be a part of their vocabulary, but most are dilettantes who know their bread and butter comes to them from commissions to design construction contract documents. This role is well understood by many architects, since it represents the bulk of their practice.

In 1967, a *new* Committee on the Future of the Profession was commissioned to explore the changes expected in professional practice in the next 25 years. Unlike previous committees, this group went outside the architectural profession and brought together representatives of owners, entrepeneurs, contractors, large corporations, investors, financiers, consultants, economists, and the government. But although the new committee received funds to study this ubiquitous subject in greater depth, it has produced nothing concrete to date.

Several other recent activities reflect the AIA's confused nondirectional mood. It offers a series of separate reactions to its problems with the apparently naive hope that someday the fog may clear. Some of the subjects follow.

Profits: Perhaps the most significant recent AIA study was The Economics of Architectural Practice by Case and Company, Inc., management consultants. Its significance lies not so much in the findings, but in the fact that this was the first time in the 10 years since the AIA began questioning the role of the professional architect that the AIA had com-

"The contractors had no intention of becoming subservient to the architect."

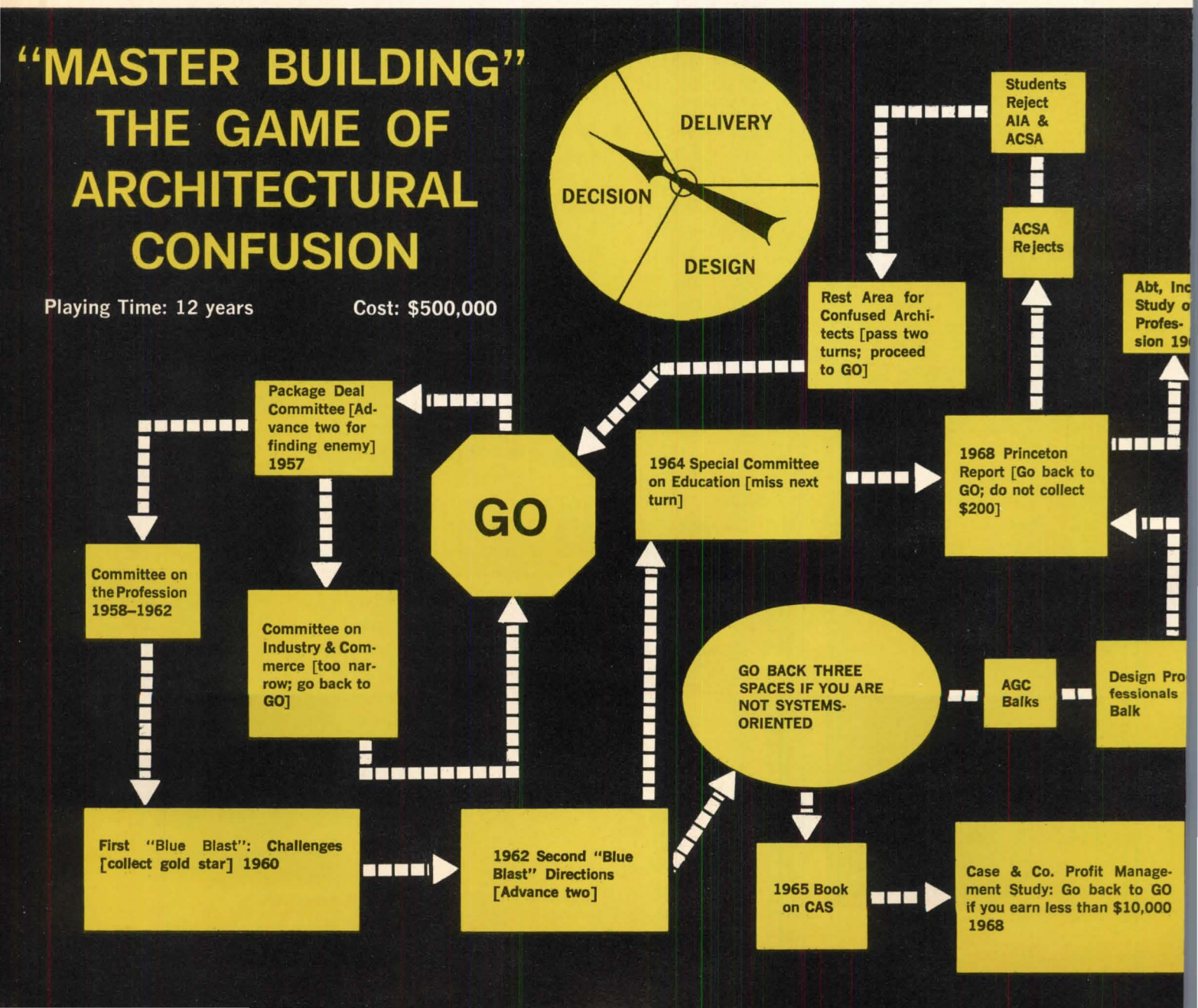
missioned outside experts to analyze the architect. These findings show most architects are rather poor businessmen. Under these circumstances, if architects cannot handle their own business affairs, clients may be disinclined to commission them for nontraditional services such as financial analysis or construction management.

Education: The AIA also decided to seek outside expertise in the development of educational curricula. In late 1968, it retained Abt Associates, a Cambridge, Mass., research firm, to look objectively at the future of architecture through 1985, and to develop specific curricula recommendations. The consultants have not yet reported their findings.

New Technology?: In April 1966, the AIA's Research Committee published *Emerging Techniques in Architectural Practice,* a compendium of the business and professional practices of some of the more advanced architectural offices. However, as the later Case and Company study implied, the techniques were not representative of most architects' practices. And, in early 1969, the AIA Research Committee's report on the use of the computer in architectural offices further emphasized the way architectural practice lags behind the requirements of the master builder and CAS philosophy developed seven years earlier.

Another of the recent studies haphazardly sponsored by the AIA was a study of programming (i.e., the process of translating human, organizational, and equipment requirements into physical space allocations). The study was published in February 1969, but is only a first step in the long road to improving these skills of the architect.

Finally, the AIA's recent handling of the federal turnkey program is perhaps the strongest example of the profession's current state of total confusion. In early 1968, the Federal Government tried to speed new housing through turnkey developers who both design and build new housing. The similarities be-



tween the turnkey developer and the package builder are too strong to ignore, and yet, after a decade of adamantly condemning the package deal, the AIA could not make up its mind on how to handle the situation after it was put into a new context. The tragedy, however, is not that the AIA did not condemn the program, but that it lacked any strong policy to justify either condemning or supporting it. Instead, the AIA, in familiar fashion, set up another study committee and even went so far as to request that architects participating in the program submit details of their experience. Thus, by its failure to act, the AIA implicitly supported the turnkey-type package deal.

The New Villains — The architect has been reluctant to dispose of his most convenient villain, the package builder. The AIA again charged one of its committees in 1967 to study the "package deal problem." The committee's report summarized the AIA's previous efforts but this time, it called the situation "the 3 D's of the building process: decision, design, delivery." The simplicity of this new tripartite symbolism was intended to suggest that the architect must expand into the predesign decisions of the client (i.e., site location, economic analysis, space use analysis), and also expand more into the management of the construction process itself. The committee further recommended that the AIA engage in an institutional advertising program "directed to the public, as potential clients, and the profession itself, in the form of guidelines for the effective performance of comprehensive services." Again, nothing significant was done by the AIA to follow up this recommendation.

The vacillation of the AIA in its unsuccessful attempts to define the role of the professional architect during the last decade, shows that it is dissatisfied with the traditional role, and is insecure in a comprehensive services environment and quite uncertain about the future of the architect.

MERGERS: PUBLIC OWNERSHIP AND PROFESSIONALISM

Most firms have a compulsive desire to further their business growth by entering new markets and increasing profits. The merger route often provides a fast road for expansion without the risks of assembling new management teams, acquiring necessary technical personnel, developing credit and markets, and other problems associated with internal expansion. In short, a merger can provide a ready made market and the talent to tap it, and this is what motivates mergers by professionals.

Mergers involving professional organizations differ from the conglomerate mergers that have gained much attention in the financial news recently. Conglomerate mergers typically involve two publicly held corporations whose stock is traded on the open market. Frequently, the markets and talents of the two firms have little relationship to each other. Even if they do, the motivation behind the merger is likely to focus on financial considerations: a response to the workings of the stock market; a game of price/earnings ratios, warrants, convertible issues, cash takeovers and *similar problems*, which, while important, are usually not the principal reasons for mergers by professionals.

Synergism — the $2 + 2 = 5$ effect — is probably the term that best describes the motivation behind mergers among professionals. It means that teams of professionals tend to perform better than the sum of their individual performances. The effects of synergism may be felt in all aspects of the team organization, marketing, internal services, management, and technical talent and finance.

Let us look at these reasons more closely. Professional service firms are collections of technical and management brain power, so it should not be surprising that the acquisition of key technical or management personnel or teams may often be a major reason for mergers among professionals. With such motivation, the clients of merging firms should benefit from the combined talents of the new organization. Also, the merged operation immediately gives each firm access to the markets or client contacts of the other. If each is in a different market, the result is a more comprehensive firm. Next, as the organization grows larger, it has the potential of providing more effective in-house services, such as a larger, more versatile computer center.

Another reason is that a large professional service firm is likely to have a better financial base than a few small ones. There will be some tendency for business fluctuations to balance, and a greater likelihood that the credit of a larger firm will be more substantial. Finally, a merger minimizes potential start-up losses in attempting to organize an in-house team from scratch.

The big reason for mergers among professionals, however, is the acquisition of the necessary technical and management talent to permit organizational growth. This fact should explain why these mergers typically involve only an exchange of stock with the amount contingent on the merged company's performance over a period of several years. This type of an arrangement also tends to encourage a smoother transition between the merging teams.

If an architectural firm merges with a publicly held corporation, can it still maintain its professional status? The question of public ownership has already been aired by the AIA, following the merger between Charles Luckman Associates and the Ogden Corporation. The general consensus is that the architect can continue to be a practicing professional without a conflict of interest even though the investing public "owns" him.

The Consulting Engineering Association of California has gone further than the AIA, and developed some specific guidelines for membership by a firm which is owned by persons other than registered engineers. Those guidelines were outlined by C.T. Blair, vice-president of Daniel, Mann, Johnson & Mendenhall, Inc.

(1) The professional firm must have an established practice legally authorized to provide consulting engineering services as an "end product."

(2) The firm must not be owned by a corporate group with products or services that would create a conflict of interest if used by the consulting engineer.

(3) The consulting engineering firm must remain competitive, performing a majority of its services outside its corporate family.

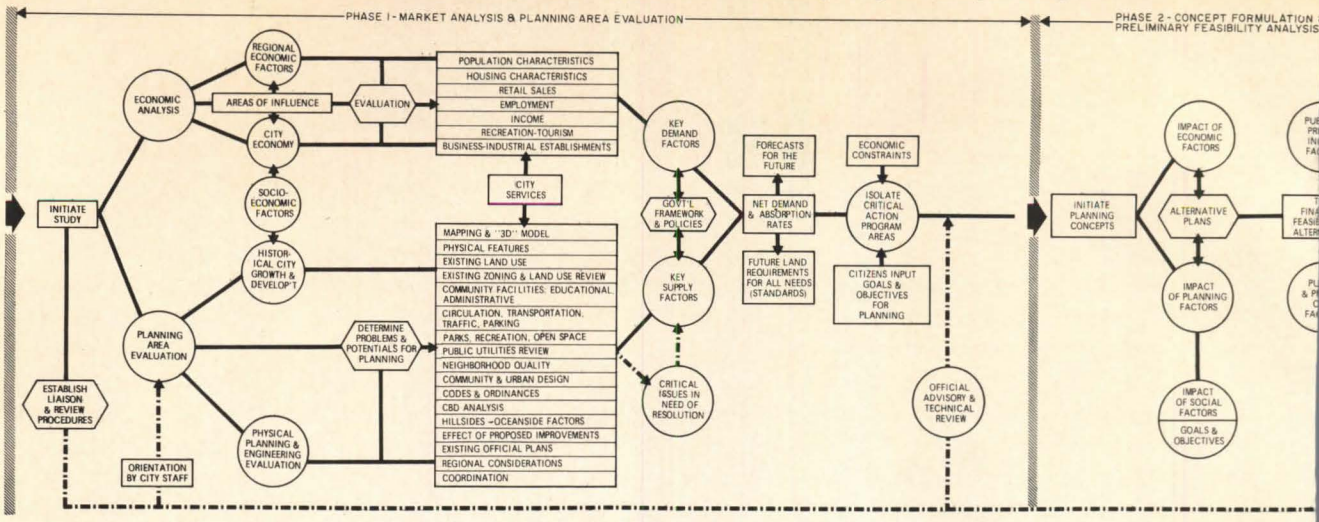
(4) The ownership group, its divisions, other subsidiaries and the consulting engineer, and their relationships must be clearly identified to clients.

(5) The consulting engineering group must remain autonomous in regards to its operating policies and technical decisions.

(6) The group must subscribe to the Association's Canon of Ethics.

Within this general framework, the stock of a corporation can be owned by the investing public without creating conflicts of interest, and the corporation will be permitted to practice as a professional organization. — P.B.F.

CITY OF LAGUNA BEACH, CALIFORNIA GENERAL PLAN PROGRAM Preliminary Program Analysis Diagram



Architects Merge With Engineers

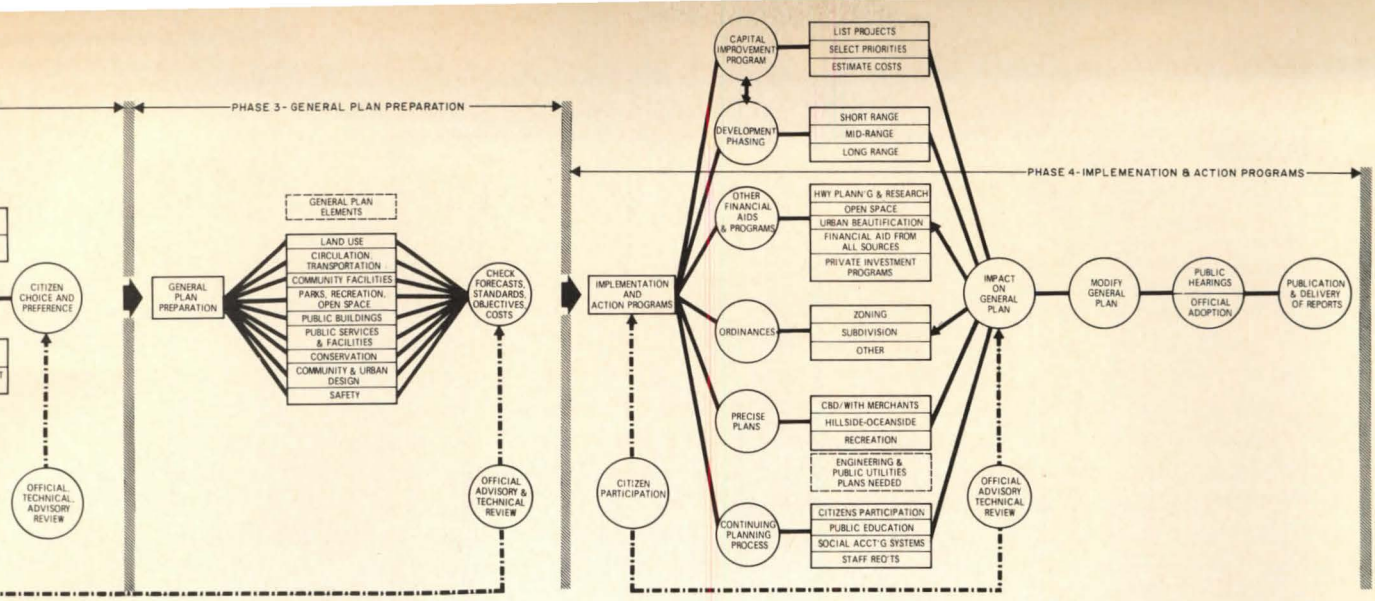
While the AIA has been embroiled in arguments and pronouncements (see preceding article), the profession itself has been changing. The largest A-E firms, for example, have steadily expanded their range of services to keep pace with new client demands, adding computers, and installing some of the management and cost-control techniques used in other businesses to afford the expansion required for effective competition. One large firm well known in the architectural profession, Daniel, Mann, Johnson & Mendenhall (DMJM), now has divisions of Systems, Urban and Regional Sciences, and Economics. It is no accident that DMJM is expanding its services so rapidly; it has three resources small businesses do not have: time, money, and extra men.

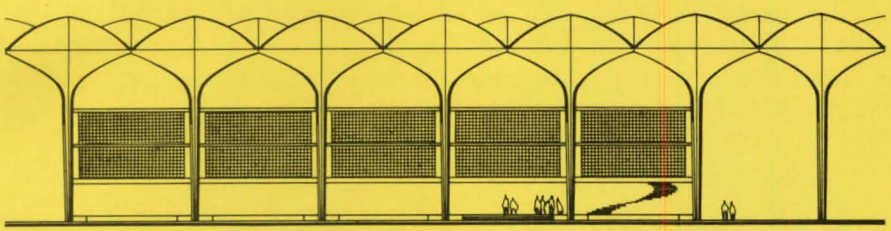
However, if small firms lack these resources, another route to expansion is open to them through mergers among themselves. This technique may develop as a business trend when the firms bought by conglomerates and other industrial managerial giants that can afford to innovate with technology increase their competition for architectural and engineering jobs. Small offices lose out because the management talent of the corporations and large A-E firms is better at obtaining clients. The business cycle for small firms is self-defeating: They have to realize larger profits on individual jobs than large firms, yet they will only get small jobs because that is all they are equipped to do. Therefore, it now seems that small architectural offices will have to start merging with each other in order to stay alive.

Many architects are well aware of the competition coming from outside the profession, and are attempting to stay alive by offering a comprehensive services package to clients. A few, such as DMJM, already compete with the new professionals for the same contracts, often ending up as one of many subcontractors to the Government or a big corporation on a project where other subcontractors may be systems firms and research organizations. But the main body of architects, still ensconced in small offices exclusively doing design work, may also begin to expand their services and offer management consulting, construction management, real estate financing, systems engineering, and similar services. However, indications are that these awakening firms will find, as the noted French journalist and industrialist Servan-Schreiber, author of *The American Challenge: American Business in Europe,* has observed, that American business has a monopoly on technology and the management ability to respond quickly to new markets. His remarks about small European firms' inability to compete with American giants seem to apply to the small architectural office's problem with the giant A-E firms and corporations staffed with the new professionals.

Three In One — Thus, the merger tactic among small offices may be the only route open. One recent venture in New Jersey is worth noting because, if it proves successful, other firms will perhaps follow the lead. A 10-man architectural firm owned by Jules Gregory merged with two other small offices — Tectonic Associates, a predominantly engineering A-E firm, and Diehl Miller Busselle, planners and architects — into a new corporation called Uniplan.

Together, the three have a total staff of about 65, which is small by industrial standards but large in relation to the architectural field (average office size of architectural firms: 6.3). Moreover, Uniplan is one of the largest A-E firms in the state capable of offering clients a wide range of professional services. Gregory explains that "mass is what the interesting problems call for — a mass of money and a mass of people." More specifically, he says, "Uniplan provides a completely integrated team encompassing all professional disciplines needed to develop the solutions for projects and follow through to completion. We are convinced that this integration of professional disciplines produces more effective coordination, improved schedules, and deeper understanding of construction economy."





Railroad station at Dacca, Pakistan, designed by The Louis Berger Companies.

Software Firm Buys A-E

Six months ago, one of the fast-rising data processing companies bought a large architect-engineer firm for $7.5 million. The transaction plugged The Louis Berger Companies of Orange, N.J., into Leasco Data Processing Equipment Corp., a $1 billion organization that offers "brainware/software and technological expertise, and has the capital funds to sponsor on a participatory basis many of the solutions it provides to government and industry."

The Louis Berger Companies have a staff of 900, working in 30 countries, producing a $10-million revenue with a net income over $600,000. Its staff includes economists, urban planning engineers, architects, transportation specialists, agronomists, oceanographers, systems analysts, civil engineers, and other professionals.

Berger started in highway design and construction supervision in 1940, and this is still a major share of its business. Then it spread into foundation engineering, photogrammetry, and electronic computation for which it owns aircraft, mapping devices and data processing equipment.

In the late 1950's, Berger Companies found a market overseas for architect-engineering services in Europe, Africa, Asia, Central and South America. It established foreign companies with complete autonomy, but backed up by central administration in the U.S. Foreign work represents a large percentage of Berger's business, "and its architect-engineering services have rapidly expanded to encompass not only the developing countries' basic needs for transportation, water, shelter and industries but also the civilian and military requirements of the mature economies of Europe."

Just before joining Leasco, Louis Berger noted, "Architects and engineers cannot afford to leave the solution of social problems to the giant corporations. They are too large and too impersonal, and although they are good at forming total concepts, they are not very good at obtaining inputs from the professional disciplines. Consulting engineers will lose this entire field by default unless they move into it now. In 10 years, it will be too late."

In the same article in **Consulting Engineer,** he stated, "About one-third of our gross income comes from studies and reports involving nonengineering aspects, such as economics and sociology." There appears to be no shortage of non-design professionals for jobs with firms such as Berger, for he says that 65 graduates from the Harvard Business School applied for five openings on the staff. Many of the non-design staff work for a Berger company called Development Economics Group.

The DEG was established to "bridge the gap between the techniques of the civil and industrial engineer and the methods of the financial analyst, economist, development planner and systems analyst." It offers services in regional development and planning, transportation planning, agricultural, industrial, water resources, housing and urban surveys, and investment surveys.



Study for Atlanta Rapid Transit System.

A-E in Power Company

Founded on January 1, 1885, Parsons, Brinckerhoff, Quade & Douglas is one of the nation's oldest engineering firms, and the twelfth largest. Its primary interests have been and still are in engineering. But through affiliation with Lord & Den Hartog, architects and planners, and National Electric Service Corporation, Parsons Brinckerhoff now offers totally integrated architectural-engineering-planning-construction management services.

All seven Parsons Brinckerhoff partners serve concurrently as partners of L&D, and three also as corporate officers of NES. All three firms maintain headquarters in the same New York City building. Each is autonomous internally and free to negotiate contracts, but each affiliate has the advantage in negotiation of being able to draw freely from specialists of the other firms for any project team. Together, they offer a staff of more than 700.

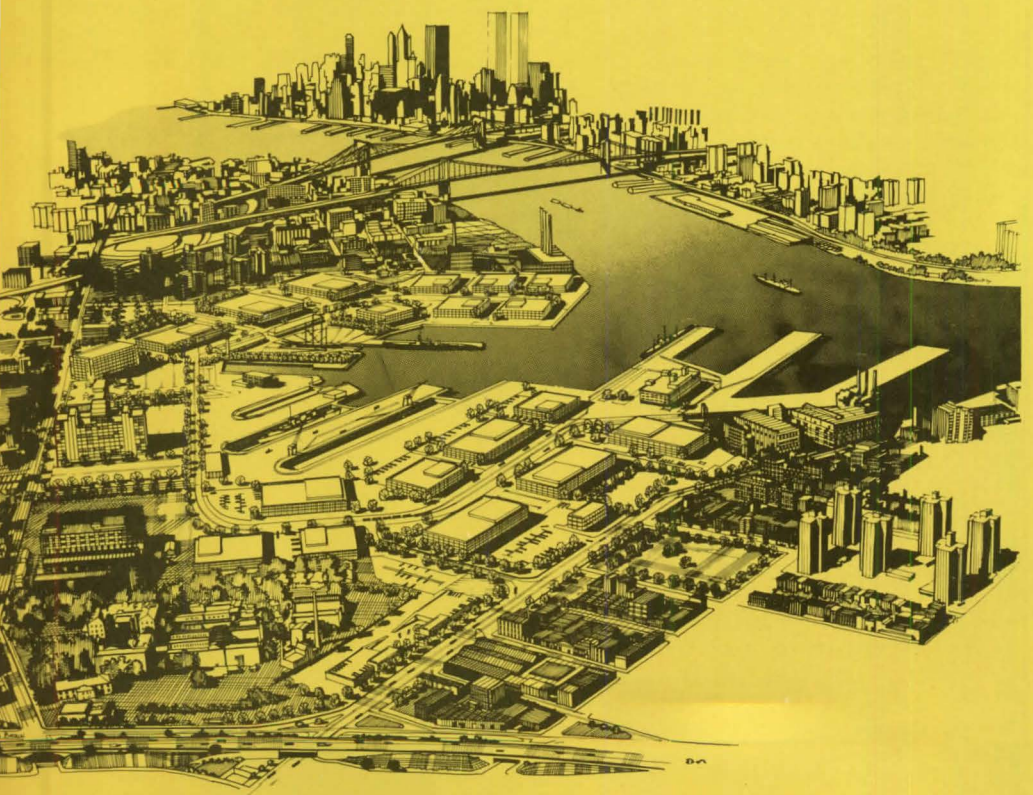
Parsons Brinckerhoff's most publicized projects still fall primarily into the engineering realm — the San Francisco and Atlanta rapid transit systems, the suspension bridge at Newport, R.I., designing of a sewage system for Okinawa. But more and more architectural projects are finding their way to the combined firms, and, after all, the affiliation with Lord & Den Hartog is only three years old.

As an example of the new firm's increased range, it is hoping to get a job to design 5000 housing units for an urban renewal district, a job Gregory never could have hoped to get with only a 10-man firm. But the most exciting project Uniplan has embarked on is forming a development corporation and raising the capital for the building of a new town. Lawyers and sociologists, economists and planners will be required for the project, and now Gregory, Tectonic, and Diller can jointly afford to hire them when needed.

Gregory, a vice-president of the AIA, says his new partnership is not contrary to the AIA ethical standards, and that the problem of "ethics" is surmounted (as well as the New Jersey ruling that architects cannot form corporations) by the partnership being the owner of the corporation — that is, the 9 partners (8 architects, and 1 engineer) legally register as a partnership and that partnership in turn owns the corporation called Uniplan. That this tortuous, time-consuming structure is necessary at all is an indication of its archaic quality, because the only difference between a partnership and a corporation is simply a legal nicety, since the liability of professionals is protected by indemnity insurance. Practically speaking, there is no difference, then, whether the nine partners call themselves a partnership or a corporation.

Professional Ethics Predominate — Uniplan will have a construction department that will offer clients construction management services. But, as professionals, Gregory's firm cannot guarantee costs as package builders can. Gregory feels this is no disservice to the client, and will not inhibit firms such as his from competing effectively with package builders, since, in his view, they have to pad costs in order

Large and Small Jobs Total $1 Billion Annually



TAMS proposal for the redevelopment of the Brooklyn Navy Yard.

Not all Tippetts-Abbott-McCarthy-Stratton projects are on the scale of the Brooklyn Navy Yard redevelopment or the creation of the 500-acre Little Dix Bay resort in the Virgin Islands (p. 191, SEPTEMBER 1965 P/A). It also designs small jobs, such as cafeterias and parking garages. The big and the small jobs of this international concern during the past five years total more than $3 billion and right now it is working on new projects worth about $1 billion.

TAMS has a U.S.-trained professional staff of about 500 in seven U.S. and 16 overseas branches, plus an additional 200 foreign engineers. Services range from economic feasibility and land-use studies to urban renewal planning to complete design and construction supervision.

In New York City, TAMS undertook preliminary studies on the Brooklyn Navy Yard redevelopment as a joint project with the Institute of Urban Affairs at Fordham University, under contract with the U.S. Department of Commerce. Under the TAMS-Urban Institute preliminary proposals, the 265 acres of the former shipyard would become a diversified industrial complex operated

to eliminate risks and guarantee profits.

At a time when everybody is describing himself as a "professional," Gregory thinks that, in the building field, architects offer a unique set of qualifications and will continue to obtain many clients since their training and ethics enable them to make better decisions for the client than package builders or developers. And, even if Uniplan or another architectural organization should act as owner-builders, the problem of ethics does not stand in the way. The professional ethic was formulated to insure that architects did not prejudice the client's interest, so there is nothing inconsistent in the architect serving as his own client, according to Gregory.

Others have questioned this, however, saying that if the aim of the architect-owner is to make a profit out of the building he designs, he will cut design corners in order to make the costs absolutely minimal and thereby increase his profits. Gregory's reply is that the building will still be better if it is architect-designed, and the typical client, ignorant of architecture, is not there to say no. He points to a case where the client of a developer lost money because the developer was dishonest and the architects working for him were powerless to do anything about it. In any case, it seems obvious that there are professionals who, as their own clients, would sacrifice design quality for a higher profit, and there are professionals who would be content with a smaller return on investment; just as there are now professionals who pride themselves on high design quality and others who do not. As long as the market place is structured so that exorbitant profits can be obtained from poorly designed and ugly buildings, those buildings will be built, whether the chief officers of the developer are architects or accountants.

by private business on long-term leases. This would provide growing room to add 15,000 jobs that might otherwise be lost to the city. Hopefully, renewal of the adjacent areas would follow.

Other major projects of the firm include the Dallas/Fort Worth Regional Airport, planning the $40 million remodernization of two miles of the East River waterfront in lower Manhattan, planning for a new town in Maryland (Joppatown) and one in Puerto Rico, building the Pan American terminal at Kennedy International Airport — to which it now will add a $50-million addition (see p. 43, JANUARY 1969 P/A), planning and development for a 500-square-mile region in West Malaysia, serving as engineering advisor on the reconstruction of South Korea for the United Nations. And perhaps it is really indicative of the freedom a large firm has to consider any kind of project that even smaller projects can take on an exotic ring when they are a hotel in Athens, a bowling alley at an Air Force base in Greece, a four-chair dental clinic at Wheelus Air Force Base in Libya, or a community center in Rangoon, Burma.

Turnkey Splits Off Its Own A-E Firm

In the three decades from 1936 to 1966, Burns & Roe, Inc., grew from a one-man consulting office to an international engineering corporation of more than 1000 employees. Deeply involved in power engineering and aerospace technology, this design constructor firm relies heavily on electronic aids for its own work. A 72-ft-long computer and data processing system complex is located on the main floor of its two-year-old headquarters in Oradell, N.J.

Burns & Roe's international operations cover projects on six continents and often include nuclear, cryogenic, process, and chemical engineering as well as mechanical, electrical, structural, and architectural design. Services may range from consultation on a particular problem to complete construction management and actual plant operation. It has even many times assumed the role of agent-contractor, hiring and training native craft labor in remote areas.

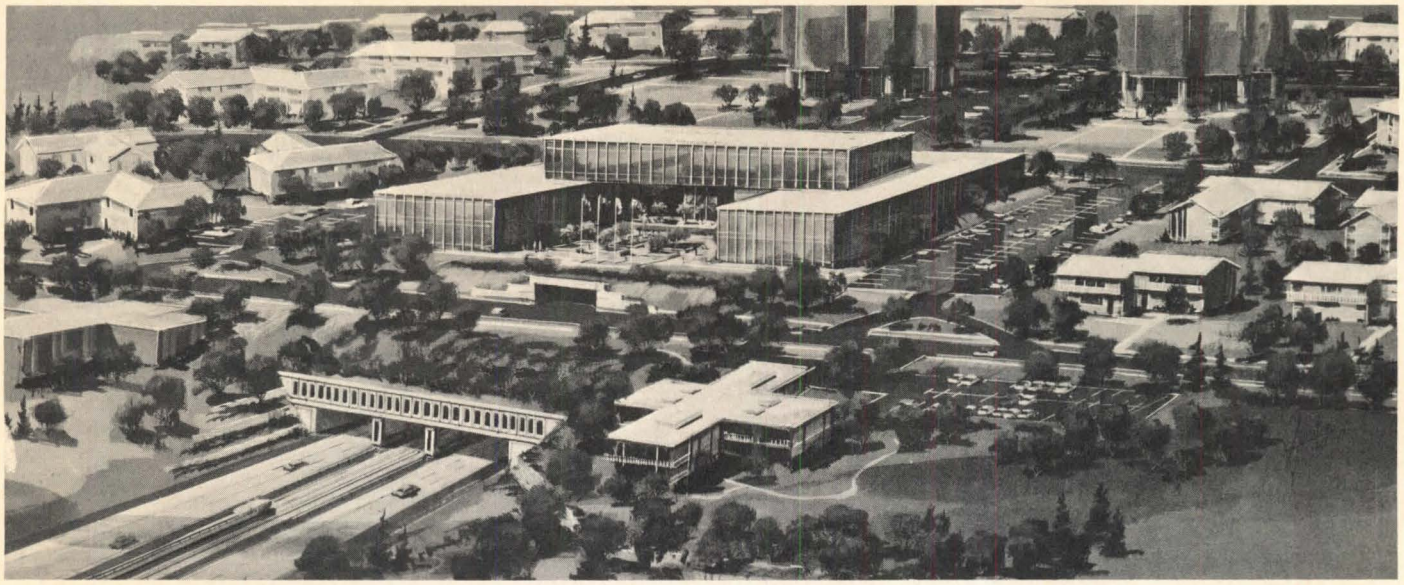
A year ago, however, the president of Burns & Roe, Inc., Kenneth A. Roe, and chief architect Joseph R. Pniewski, formed in addition to the engineering-oriented firm, their own architectural-engineering firm, Roe Associates.

According to Roe, the step was taken because "I feel that the creation of a separate architectural organization can form a design team relationship with Burns & Roe, Inc., which will provide our clients with more complete and creative design services in architecture and engineering."

Omaha Firm Expands Through Acquisition

Henningson, Durham & Richardson of Omaha has grown from a one-man Midwestern engineering firm to become an engineering architectural concern that ranks thirty-second in the U.S. in gross income, with projects spread across the map. Next year, its volume will increase, since it has just bought Thomas B. Bourne Associates, Inc., an A-E firm in Washington, D.C.

The company originally added architects only to assist engineers on projects that were primarily engineering in nature. Now, the organization's 400 employees are drawn from all phases of the engineering and design disciplines. Services run the gamut from feasibility studies and financial analyses to interior design, landscape architecture, and road and traffic design as well as handling major engineering, design, planning, and construction projects. Although most of the firm's architectural projects are still concentrated in the surrounding Midwest-Southwest areas, it has been involved in such diverse undertakings as a regional and transportation master plan for the kingdom of Libya in North Africa, military master plans for Thule and Sondrestrom Air Bases in Greenland, irrigation system studies and designs in Spain, waterworks projects in Rio de Janeiro, and, in joint venture, the $40-million expansion now underway at the U.S. Air Force Academy in Colorado Springs.



Urban planning study for Mt. Baker Ridge, Seattle, Wash., by Howard, Needles, Tammen & Bergendoff.

Engineers Move Into Environmental Design

Engineers outnumber architects by about ten to one, and, with the superiority of numbers, they are taking over a lot of business that traditionally went to architects. No longer can they be considered to be merely technicians who make buildings stand up and wastes drain away. Engineers are in the environment business just as seriously as architects.

Although architectural firms will doubtlessly continue to design buildings that are intended to be "monuments," there is no certainty that they will remain as design leaders in less heroic construction. Many engineers believe that they shape a building by its structure and mechanical and electrical services. Their enthusiasm can carry one step further to reason that they could literally shape the whole building from programming requirements to architectural design.

Naturally, individual engineers do not want to assume the role of architectural designers, but they would like to have such a designer on their staff to work closely with the engineers. This would enable the engineer to usurp the architect's traditional position as head of the professional building team.

Such a switch would not upset too many clients. They would recognize that the engineer's rational, scientific processes may make him a better candidate for leadership than an architect whose decisions are often supported by little more than creative intuition.

To support this contention, one only needs to read the brochures of some of the largest engineering firms in the country. They offer architectural services and professional services closely allied to architecture that many architectural offices envy. Many firms describe themselves as architect-engineer or engineer-architect, but some cling to the title engineers and yet do architectural work.

Howard, Needles, Tammen & Bergendoff, Kansas City, Mo., is an engineering firm that branched into architectural services without changing its company designation as consulting engineers. It opened a department for urban and regional planning in 1964 that now accounts for between 5 and 10 per cent of the firm's $18 million annual billing. Howard, Needles is rated as the largest of all architectural and engineering companies in the U.S., so its position is not exactly typical of the profession. It employs about 70 people in the urban planning department, 60 per cent of whom are professionals such as architects, planners, economists, landscape architects, and geographers.

Many of the big engineering firms are hired for transportation studies, and since transportation involves changing the face of cities and suburbs, these firms end up in the planning business. Hence, they hire a staff with the capabilities for these expanded services, and exhibit a sensitivity toward environmental problems that surprises "pure" architects.

Charles DeLeuw, chairman of the board of DeLeuw, Cather & Co., consulting engineers, Chicago, pointed out in an address to the American Society of Civil Engineers: "In urban environments, we must often create beauty where little now exists. We must learn to understand that what is interesting and exciting to engineers is not always so viewed by the layman. Design cannot stop at the building line, moreover, nor at the limits of right of way. What would be entirely appropriate in one environment might look drab in another setting and too garish in yet a third."

But in the same way as engineering firms are moving into architectural and planning fields, architectural firms are expanding their domain by hiring

engineers or merging with engineering firms. What may be happening is a merging of identities between architectural and engineering organizations. Baltimore architect Archibald C. Rogers is quoted as saying, "Look to an increasing fudging of the lines between our professions, and welcome it."

Not all architects welcome the sentiment or the reality. Many are obsessed with preserving the long-standing role of leadership, and find it distasteful to serve in an ambiguous capacity as member of a larger team of design professionals. Gradually, however, the architectural profession is realizing that the comprehensive services philosophy recommended by its governing body is being carried by engineering firms into the marketplace with a remarkable degree of success.

Engineer Assigns Work To His Own Corporations

Three years ago, Theodore J. Kauffeld, a New York City consulting engineer, hit the top of the **Engineering News-Record** list of architects and engineers, but most members of these professions had never heard of the firm. This is not surprising, since Kauffeld makes a point of anonymity in his firm's work. It specializes in secret work for government agencies that it will not even name, and for industries that are supersensitive about protecting the secrecy of their manufacturing processes.

Kauffeld's business is organized differently from that of most design firms. He practices engineering under his own name, and signs all professional contracts as an individual. He then assigns the jobs to one of four corporations of which he is sole stockholder and the principal officer. This complies with the New York State law prohibiting the corporate practice of engineering.

The chief corporation, Devenco Services Division, provides the financing and administration for the Chemplant Designs Division, Research and Development Division, Devenco Services Division and Devenco-Utah Division.

Kauffeld organized his business this way in order to "exploit the strength of both private and corporate ownership while sidestepping the shortcomings of each." He gains the advantage of making decisions as an individually owned firm while being backed up by the management skills of a corporate staff. And, not insignificantly, Kauffeld can take advantage of the tax benefits from the corporate equity and capital gains laws.

Systems Firm Buys Consulting Engineers

Hill, Ingman & Chase, a 78-year-old consulting engineering firm in Seattle, works in joint-venture with three other engineering firms, and is also part of a large computer-oriented organization in Californa. Hill's engineering work centers in the municipal field, and is one of four firms, jointly called Metropolitan Engineers, that is responsible for pollution abatement in Lake Washington and Puget Sound, and for the design and construction of metropolitan Seattle's sewage facilities.

Hill, Ingman & Chase affiliated itself with URS Systems Corporation of San Mateo in order to "fulfill the needs of our clients for a constantly broadening scope of services in connection with our Urban Engineering and Development Field."

Also, as William Chase, Hill's executive vice-president said, "As a firm grows, so does its value. Therefore, if ownership is to stay strictly or nearly within a firm, only the wealthy, not necessarily the best qualified, will be able to rise to top management positions. We do not feel that this is in the best interests of the staff or the clients."

URS specializes in computer applications for physical and engineering sciences, urban planning, management and economics, and the usual range of education, defense and industry that software specialists get into.

URS describes its corporate policy as follows: "To devote a major portion of our professional activities to work which improves the quality of man's physical and social environment. And to maintain a straightforward, humanistic relationship with people — staff, clients, shareholders, and the general public."

Hill is only one of several companies in URS. It is a wholly owned subsidiary, and joined URS through an exchange of stock. Hill's officers are also officers in URS, and sit on the board of directors. URS acquired another design firm last February when the Ken R. White Company of Denver joined it. White is described as the largest engineering-architectural firm west of the Rockies, and has offices all over the U.S. as well as in Rome and Saigon.

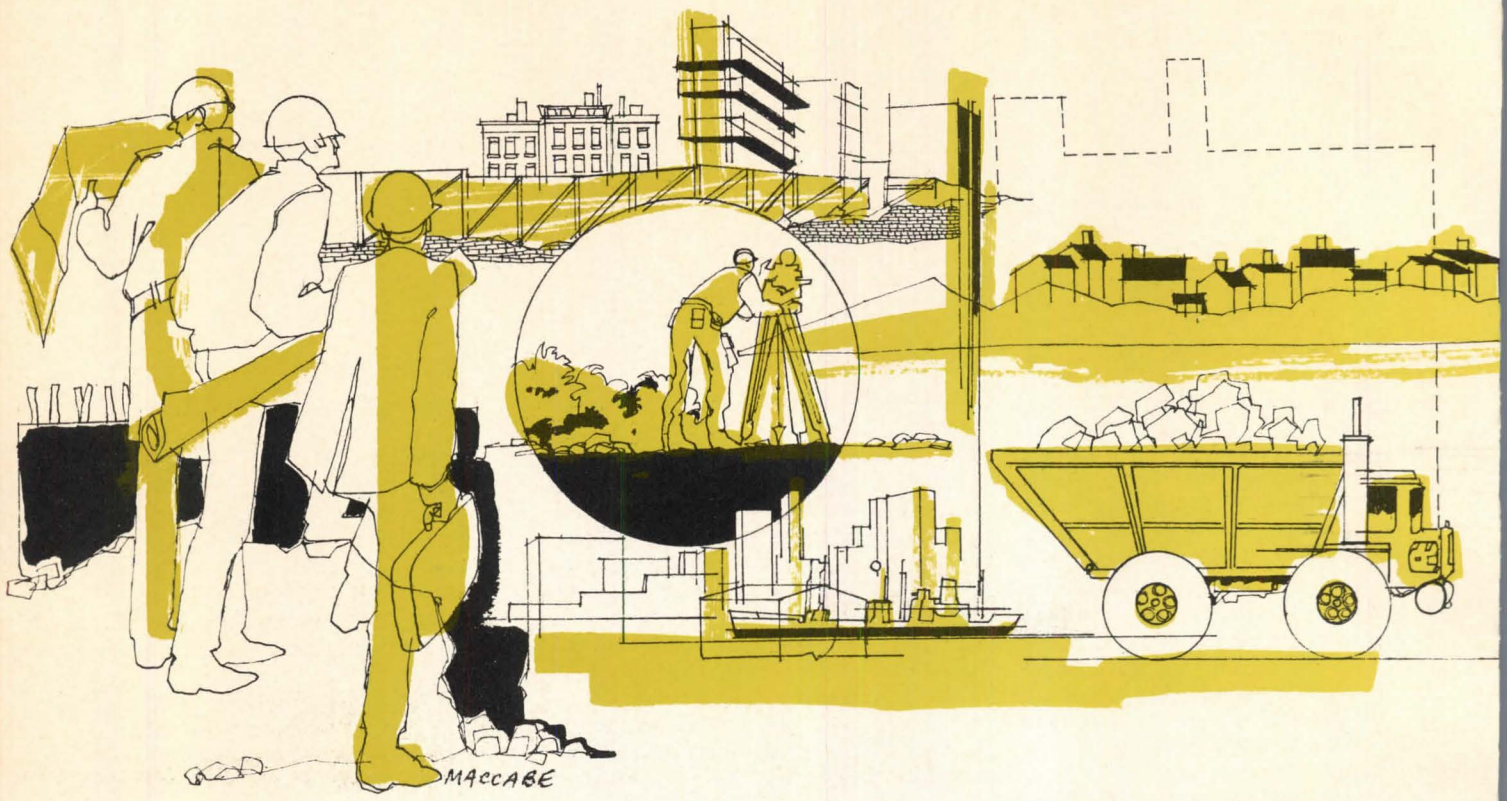
Boston Firm Plugs Into Conglomerate's Finances

Metcalf & Eddy, Inc., engineers with headquarters in Boston, Mass., is a 70-year-old firm with a staff of 500. It offers the usual engineering services in water, foundations, sewage, refuse, and military, but in 1961 it opened a Planning and Renewal Department comprising regional planning, community planning, and urban renewal.

In September, 1967, Bangor Punta Corp., acquired Metcalf and Eddy. Bangor is a financial organization that describes itself as a "unique conglomerate . . . with 63 percent of its earnings derived from two of the fastest growing industries in America: Leisure Time and Public Security. The first stems from the changing economic status of the American consumer; the other from America's social problems."

Bangor relieved M & E of one of its major problems: how to expand a professional business that had outgrown its financial structure. It required working capital in excess of $2 million, and had been told by its bankers that it was too small to obtain public stock ownership, so it looked to join a financial organization. By joining Bangor, Metcalf received "the complete freedom from being on a banker's note." And, it also looks forward to the financial security of being able to acquire other firms in order to diversify its engineering or planning services. Bangor, in turn, got two things from Metcalf: increased earnings, and a new, prestigious classification for its list of groups — Professional Services.

Harrison P. Eddy Jr., M & E's president, says that the firm has complete independence from the conglomerate in areas of professional practice. He also predicts that most professional engineering firms will eventually have to be incorporated, for which legislation will have to be updated to permit the corporate practice of architecture and engineering.



CONSTRUCTION MANAGERS SET DESIGN PARAMETERS

Scientific cost control and scheduling by construction managers affects building design.

As construction management steadily expands the range of its services, the volume of work naturally increases. Some of the expansion reduces the over-all services provided by architectural and engineering firms, some of it affects the contractors and package builders. All of it presumably benefits the clients, or else they would not continue to turn to construction managers for more jobs.

A construction management firm serves in a professional capacity as advisor to a building owner to insure that he gets the best available facilities for his requirements at the most economic cost in the shortest possible time. The manager stands poised midway between contractor and architect to balance the art and science of building design with the availability and cost of the best materials and construction techniques.

To function most effectively, a construction management firm must be a professional agent of the client. Since many management firms are also contractors, the inevitable conflict of interest charge is leveled at such firms if they also bid or negotiate a construction contract for a job on which they serve as consultant. Many contractors and clients preclude this situation by prohibiting a construction consultant from bidding.

General contractors move easily into construction management because they use the experience and skills gained in one field to good advantage in the other. There is no equipment to buy, except office equipment and time-sharing on a computer, and the key staff is already trained and on the payroll. So the contractor sells his management knowledge for a fee, and without even trying can convince the client that for future contracts he is available to change hats and become a contractor again.

Management consultants also turn their attention to construction management because they possess the managerial skills and are accustomed to computer programs such as PERT and CPM. Although these firms did not have construction experts before they moved into this new field, they could hire them to round out the management team. Some management consultants do not try to assume expertise in construction, and limit their services to computer programming and finanacial analyses of their client's requirements.

Consulting engineers switch easily into construction management because of their construction, computer, and business experience. One firm that lists itself as engineers and construction consultants, McKee-Berger-Mansueto, Inc., is involved in management work on more than $2 billion worth of construction a year with a professional staff of 150. The 10-year old firm offers feasibility studies, cost estimating, specifications writing, economic studies, computer scheduling, and project management.

Bolt, Beranek & Newman, Inc., which started as an acoustics and noise control consultant 20 years ago, expanded into other engineering fields and then into construction management. To do this, it bought a small firm called Construction Projects Management, Inc., with a client list of owners, architects and engineers, and general contractors.

Management Starts With Predesign — Construction managers unanimously say that the ideal time for them to be hired is before the owner retains a design firm. This enables the owner's construction consultant to focus the objectives of the owner and transmit the requirements to the design architect. It also enables the consultant to establish the limits of size, facilities, and materials that the designer can use without exceeding the budget.

The managers can also analyze the owner's needs for raising finances, site location, space and process requirements, and the type of architectural and engineering services. To operate these complex services, a construction management consultant has to hire executives, systems engineers, financial analysts, computer programmers, architects and engineers.

Potential building owners turn to construction

managers for a variety of reasons. Large corporations that have their own in-house construction and real estate groups may not need consultants, but companies without construction expertise do. They need help because of the increasing complexity of technology in buildings; because of the difficulty of integrating project financing with the other needs of business capital, because investors demand an owner be more precise in analyzing building programs, and because an owner has to have close coordination when there are several projects at various stages of development in a master plan.

To give the construction management companies' view of this business, P/A talked at length with Tishman Realty & Construction Co., a leading consultant that entered the field with 60 years experience as an owner-builder.

Selling Construction Management

Two years ago, the architectural profession was startled by a 20-page insert in a Sunday edition of *The New York Times* entitled "The Skyline Makers." In it, Tishman Realty and Construction Co., Inc., stated its case for marketing its talents as owner-builders. Tishman claimed that "neither architects, general contractors nor real estate consultants can independently supply sufficient total information to compose a complete integrated [building] package," and proposed that developers should turn to owner-builder organizations that could offer their expertise through the relatively new business of consultant-contractor.

"The consultant-contractor considers his client's project as though it were his own and acts accordingly. For this he receives a fee, as benefits his responsibility, his unique combination of development, construction and real estate skills, and the substitution of his clients project for one of his own." Tishman offered to share 70 years of building experience in building services commonly considered within the realm of the architect, engineer, real estate consultant, owner and financier and many others. Among the services are:

- Evaluate site selection.
- Relate the needs of the market place to the project.
- Evaluate type and size of building for major users.

"The consultant contractor considers his client's project as if it were his own and acts accordingly. For this he receives a fee."

- Evaluate their ability to finance the building.
- Recognize the architects' problems as related to aesthetic considerations.
- Reduce costs through their intimate relationship with building and material product suppliers.
- A knowledge and respect of the subcontracting field.
- Project completion on time, through scheduling and coordination of building trades.
- Contribute a knowledge of tax laws, zoning regulations, building codes and the jurisdictional patterns of the unions.
- Supply a purchasing leverage as a large buyer of construction materials and services.
- Advise on the current availability of sources of mortgage loans.
- Contribute a knowledge of long term building operation and maintenance.

After listing the above services, Tishman queried, "But, you may ask, don't top-flight architects and engineers feel uneasy about an 'outsider' looking over their shoulder, so to speak? Isn't there a danger of professional jealousy and conflict of egos? Surprisingly enough, the answer to both questions is a resounding 'No.' "

Whether egos or economics are concerned, a segment of the profession does feel the architectural function is being encroached upon by the increasing success of owner-builder and consulting-contractor organizations such as Tishman.

P/A interviewed Joseph Newman, vice-president in charge of Tishman Research Corporation, and Joseph M. Leonte, vice-president in charge of architectural liaison, to find out if the architects' concern is valid.

The Contractor as a Professional — "We have found that an architect is willing to work as part of the project team," says Newman, "because a builder in the team brings the realization of his objectives much closer, and makes his task easier. He is certain that the job will be produced at the price intended. When architects work without the contractor in a professional capacity, they risk the successful achievement of their major objective."

The negotiated project in which the owner concurrently enters into a contract with a contractor (sometimes called a project manager or a consultant-contractor) and architect is increasingly common on major projects. With this contract, a fixed schedule of fees related to the anticipated cost of the project is agreed upon. The contractor provides advice and consultation with the owner and the architect during the development of the plans. Budget cost estimates for the construction of the building, acceptable to the owner and the architect, are then determined. The contractor oversees the bidding process on the owner's behalf, and supervises field construction. This provides consulting service by the same organization that will ultimately be accountable for work in the field.

The difficulty in adapting such a procedure for general use is that very few general contractors are capably staffed to fulfill this comprehensive service, Newman claims.

Under the present system, an architect estimates but does not guarantee cost when he undertakes a project. If it comes in over budget, it is sometimes necessary to redesign the project, which is a laborious and costly procedure for everyone. One of the most significant benefits in the consulting contractor relationship is his continuing, day-to-day availability of construction knowledge that allows the architect to make knowledgeable decisions, based upon accurate cost information and current construction practice.

"If the subcontractor has another way, we are in a position to listen and make a cost-benefit evaluation."

End of the General Contractor? — "It is inevitable that the general contractor on large projects, as we know him today, will disappear within a decade," says Newman. "He will become a professional, the same as the architect and engineer. If the contractor markets his services professionally, the competition is placed on the subcontracting specialists who do the actual work."

In the conventional procedure, the lowest bidder is awarded the contract for a predetermined building method. In a more sophisticated tender, such as advocated by Tishman, the tradesman's judgment is solicited prior to and during bidding. He is invited to evaluate procedures and methods in light of his own trade expertise. "We do not know it all," says Newman. "If the subcontractor has another way, we are in a position to listen and make a cost-benefit evaluation. This gives the project team more options by which to make decisions."

In a sense, this is practicing the performance approach, whether or not performance specifications are used. The architect, under the traditional approach, selects in good faith what he believes is best for a particular job, although it may not prove the best solution in the market place. For example, a satisfactory solution to a construction problem may not work in a particular city in the spring of 1970, because of a shortage of certain tradesmen. "Why shouldn't a subcontractor who comes up with an alternate suggestion that gives equal performance be allowed to switch his approach to accomplish the same design objective?" asks Newman.

For example, this means that the subcontractors may use a system installed by available carpenters instead of one that comes under the jurisdiction of unavailable lathers to erect a wall system comparable to that specified by the architect. Tishman requests subcontractors to make alternate and unit price bids, so that if a change is necessary a dollar value can be attached to it. By having options covered by unit prices, they do not have to decide until the last moment which method will be the most favorable. This allows them to take advantage of regional conditions and

other opportunities to make substitutions that will not conflict with job performance.

Usually, the architect is reluctant to be opportunistic and make such changes. It is not so much a question of cost as it is of the architect's unfamiliarity with the ever-changing negotiating, bargaining, purchasing, and strategy of the market place, says Newman.

On the other hand, if the architect is part of a team with a consultant-contractor, he can easily avail himself of this information. He has the further advantage of being able to approach the consultant-contractor with new design concepts in order to test their feasibility, in terms of cost, prior to including them in his design. The effect is synergestic.

Scope Drawings — Under the usual system of transmitting instructions to the builder through working drawings, details, materials and construction methods are frozen at an early stage of the drawing. This often affects flexibility of action to take advantage of opportunities that may arise later.

Performance drawings may be an answer to this problem. The realization of a true performance drawing will not be possible until the industry uses performance specifications and evaluation procedures which it has been reluctant to adopt. The possibility does exist, however, of producing drawings that list only pertinent characteristics such as wall thickness, exterior finish, sound and fire rating, and allowing the contractors to build with the best available methods to suit these specifications.

There are two ways of evaluating new or improved materials or systems. One is to negotiate a price for the proposed work with a subcontractor, and the other is to negotiate a deal with the product producer, neither of which the architect is in a position to do. But this can be done by the construction consultant acting as agent for the owner. Also, a progressive owner-builder such as Tishman can subsidize the cost on its own projects or write it off as research and development, if the long-run benefits are likely to be

CONFUSING AGENT WITH INDEPENDENT CONTRACTOR

The distinction between agent and independent contractor has been one of the architect's biggest crutches in evaluating his professional status in relation to the construction contractor. Most architects assume that these terms are mutually exclusive, and erroneously conclude that builders as independent contractors cannot possibly be bound by the conflict of interest ethics of an agent (or professional, since these two terms are interchangeable).

Actually, the architect is an "independent contracting agent"!

The terms "agent" and "independent contractor" are not mutually exclusive. Warren Seavey, one of the leading legal experts on the subject of agency, wrote in **The Law of Agency:** "A servant is normally one who gives personal service as a member of a business [and is] subject to control by the employer as to his physical activities.

"An agent may be a servant or not a servant. An agent who is not a servant is one type of independent contractor. There are other types of independent contractors who are not servants.

"For agency purposes, anyone who contracts for, or contracts with, the principal other than as a servant is an independent contractor. . . . In other words, there are two kinds of independent contractors — those who are agents and those who are not."

Once this antiquated distinction is set aside, an interesting question arises concerning not only the status of the architect vis-a-vis the building contractor, but, more important, the potential of the architect as a building contractor. Because, if the architect believes that he can successfully avoid conflicts of interest while serving as both an economist and architect, then why not also accept the possibility of having the architect act as his own building contractor on a professional basis?

Architects accept without hesitation the notion that an architect can design and build his **own** buildings, since, as both principal and agent, he can never be in a conflict of interest with himself. And many architects cleverly use this basic principle to avoid charges of unprofessionalism by accepting as their fee a part interest as owner of a project. This ploy really kills two birds with one stone since they also avoid the contingent fee limitation.

beneficial. This is a perfectly legitimate procedure in business, but the architect does not have these prerogatives. The economics of architectural practice do not allow him to enter into very much research into products. This effectively cuts off architects from experimenting or quickly evaluating alternate materials.

A building is the most efficient laboratory for testing new methods, materials, and techniques. The manufacturers' recommendations are derived from laboratory experiments, which for the most part are useful but are not as valuable as experience in the actual building.

It is obvious that subcontractors are not capable of working out all of the labor saving potentials in their first use of a new material or technique. A system that on paper is supposed to save 30 per cent may actually save only 2 per cent. But this does not mean that the system is bad, cautions Newman.

The architect is in no position to ascertain if the system was treated fairly or with disdain by the subcontractor, although he is invariably held accountable for the end result.

In effect, the architect is held responsible for the human frailty of viewing anything new with suspicion. Tishman uses incentives to induce the subcontractor to make things turn out well when it judges the probability of success to be good. It also encourages subcontractors to go into competition on new concepts, and selects favorable regional climates to introduce new construction methods. The architect, on the other hand, may be in a hostile climate for a new idea because of political, labor, or other problems of which he is unaware, because he lacks means of evaluating trade conditions.

One alternative to this problem is the "scope drawing." This is a drawing that shows the basic criteria to be fulfilled. It gives the basic relationships permitting the builder to take an inch or two off a room when this is to the builder's best interest. It does not permit him to make changes in access or egress. Nor does it permit him to take away from the general feel

So if an architect's professional integrity can be preserved by such legal technicalities and also be restrained under such circumstances by the mere economic assumption that he will certainly protect his own money in the project, then why not accept the possibility of constructing equally valid protections where the architect is also the builder on a project he designed for a private client. If, for example, an architect is commissioned to design and build a building for a fixed fee independent of its cost, where, then, is the conflict? If no conflict exists, the architect should be permitted to act as an independent contracting agent for his building.

The rub here is this: Many argue that as soon as architects are permitted to act as building contractors in limited situations, the rules of the market place will begin forcing them into competition on fees and probably require them to guarantee prices. In addition, the architect would probably be forced to bid for design-build commissions. And then Pandora's box would truly be open.

It remains to be seen whether these rebuttals are adequate in a rapidly changing environment that continually questions the efficiency of today's competitive bidding practices. At least the architect should no longer smugly assume that it is presumptively unethical to be an independent contractor. And if the architect makes it over this hurdle, perhaps the next step is to ask why the architect cannot maintain his professional integrity when he builds his own design for a client. The problem lies in the AIA's inaccurate interpretation of the concept of agency, which Obligation 2.1 of the AIA's Standards of Professional Practice states is the basis of the "architect's relation to his client." Yet in Obligation 2.5, the Standards take a view far more restrictive than required by the law of agency: "An architect shall not accept any compensation for his professional services from **anyone** other than his client or employer." The law of agency generally states that no conflict of interest can exist where the principal has full knowledge of the agent's sources of profit in the transaction regardless of the source. Certainly, within this basic constraint, it should be possible to permit an architect to design and build without loss of his professional status. — P.B.F.

of the building's exterior appearance, nor does it permit too much modification in the basic nature of the cube or rectangular shape of the building. The builder cannot significantly change acoustical or environmental conditions beyond certain limits.

What it does permit is changes in details, in methods of connection, and in detail relationships. It does allow a wall's composition or materials to be changed providing it does not affect its performance.

The consultant contractor can suggest to the building team that, for example, window sizes be increased 2 per cent, or that the module be increased within reason. The building team also has the option of changing details that permit it to sidestep the disadvantages of being locked into a particular sequence of construction by the design. In essence, a scope drawing keeps construction flexible throughout the course of building.

Building Code Variances — "We can be helpful to architects in obtaining code changes because we are on the firing line," says Leonte. "Building department people have a sensitivity toward cost reduction, particularly in today's age where rental housing is so important, and is a function of the cost of the building."

"A team effort is essential to fight for code changes," Leonte asserts. If you have a persuasive argument, predicated upon an imminent project, the building department will give you a quick answer if you demonstrate to them that they would be holding up construction of a building that is contributing to the revitalization of the community.

The Government — Governmental agencies — both Federal and State — are beginning to be bothered by the fact that they are paying more than necessary for their buildings, and some agencies are seriously thinking about using construction consultants. One difficulty in doing so is the compulsory stipulation that all jobs must be competitively bid. But this can be managed, as is illustrated by the way one particular project, a university library partially funded by Federal funds, was handled.

The general contractor serving in a professional capacity as the university's construction manager arranged for the university to enter into direct contracts with individual contractors for the performance of the work described in the plans and specifications prepared by an architect and engineer.

All contracts were awarded on a standard bidding procedure satisfactory to the Federal Government. The construction manager worked with the univerity's architects and engineers during the design of the buildings to assure economic construction that was consistent with functional and aesthetic requirements.

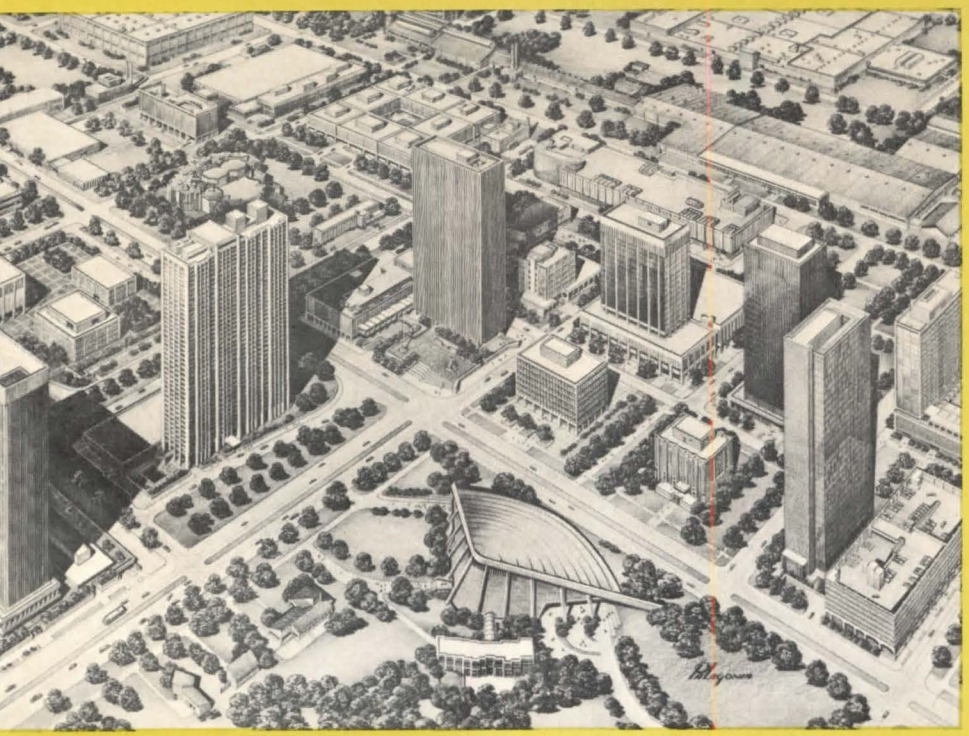
The construction manager also assembled documents for construction bids, solicited bids, negotiated with the successful bidders, prepared contracts for signatures, employed personnel, prepared schedules, controlled and supervised work in progress, and negotiated the final settlement of claims. The general contractor serving as construction manager also furnished cost accounting, and processed subcontractor requisitions and other papers required for payments and supervisory and administrative work customarily performed by the general contractor.

Before the job was bid, the contractor worked with the architect and engineer soliciting suggestions, ideas, and new systems from the subcontractors. Worthwhile subcontractor ideas were incorporated either through a performance specification, or by adding them to the bid documents. Contractors with different systems that accomplished appreciably the same result were thus able to bid against each other. The result was that the low bidder was awarded the contract without subsequent evaluation.

Drawings and specifications were made sufficiently flexible to allow several alternatives before bid documents were sent out. This was a variation of performance specifications that complied with existing laws of public bidding.

"The government now has a great opportunity," says Newman, "of coming up with enabling legislation to encourage this type of approach if it can't be done in most cases under existing legislation through administrative edict."

Market Place Design — "Being a pioneer and an innovator sharpens us. We take a fresh look at every building. We are not afraid of being first because this is part of the competitive process. If you do everything the same, you may never know whether or not you are getting the maximum from any particular technique. For example, if a town always builds in concrete and no steel gets into the town because steel



"Turner City 1968": a composite rendering of thirty-three projects illustrates the firm's diversity of construction in one year.

"The way I see it, every month of construction is a month's rent lost."

To Turner's clients, time is money. So most of them prefer the contract that saves time. The Turner Management Contract with a fixed-fee and a maximum cost guarantee.
Under this type of contract, owner, architect and builder work as a team from the start of design. Result: Turner can begin foundation work before final designs are completed — and save 3 to 6 months. We can order critical items, take competitive bids from subcontractors and schedule operations well in advance. To avoid delays.
And the builder's interest is identical to the owner's. The owner pays only the net cost. The contractor receives a fixed fee. He submits budget reports regularly for tight cost control. He is, in effect, the owner's construction manager.
Interested? Write Turner Construction Company, 150 East 42nd Street, New York, N.Y. 10017.

Turner Construction Co.

NEW YORK · BOSTON · CHICAGO · CINCINNATI · CLEVELAND · LOS ANGELES · PHILADELPHIA

One of a series of advertisements placed in **Business Week** magazine by Turner.

Turner Construction Company Prefers to Build For a Fee

Madison Avenue helps companies to spread into new markets or expand current business through the adroit use of words. It often coins new phrases or adapts old ones to put a new image on a product or service. Classic examples are the euphemistic change from coffin to casket, and undertaker to mortician. It also works in the construction industry.

Turner Construction Co., one of the larger contractors in the building (not process) field, advertises its services for the Turner Management Contract, and tells of the virtues of a manager representing an owner on a construction project. The "terminology management contract" is close kin to construction manager or consultant, but is quite a different service. What Turner now advances under a new name is the familiar negotiated, or cost-plus-fee, contract that supplied 75 per cent of Turner's estimated $300 million revenue in 1968.

Turner's brochure states: "Under the Turner Management Contract, the builder works for a fee. He guarantees the building's total cost, and the owner benefits from whatever savings might accrue as the builder proceeds in actually executing plans. The builder's profit motive under such a contract is satisfied when the fee is established. There's nothing to be gained by cutting a corner, or substituting less than specified materials. Instead, his motive is quality and owner satisfaction. The builder, in effect, becomes the owner's construction manager: his interest is to build a high-quality building fast, and for the lowest cost. Builder and owner's interests are one and the same."

The same brochure explains how the service assures strict cost control: "The Turner Management Contract does not sacrifice the cost-saving features of the bid system. Individual subcontracts for major portions of the work are awarded on a competitive bid basis. Experience shows that some changes are inevitable as a building progresses, and that overall costs do vary slightly. Under the Management Contract, the builder is paid a fixed fee, and the owner pays only the actual net cost for any changes he makes."

However, Turner does perform straightforward construction management contracts, and last year took on the task of managing construction of the Birmingham-Jefferson Civic Center in Birmingham, Alabama. Since this is a major construction project estimated at $34 million, P/A asked the owner why it hired a construction management firm.

The owner is an independent authority composed of citizens who volunteer their services. The chairman, A.S. Lacy, said the authority had no staff, and it needed the guidance of a consultant so that it did not have to depend solely upon the expertise of the architect and general contractor.

The architect, Geddes, Brecher, Qualls & Cunningham, the Philadelphia firm that won the design competition for the civic center, made the original suggestion to hire a consultant, but the authority took a year to make up its mind to do so. The stumbling block to agreement was that committee members believed in the local Southern tradition that the architect should perform necessary supervision of the construction and be in a position to control costs, and that a consultant would duplicate this obligation.

However, the Sydney Opera House debacle loomed ominously in members' minds, and they finally agreed to a consultant.

Turner's contract called for it to provide a contract budget for the project, and when drawings and specifications were available it prepared a definite cost estimate. After this, the construction manager administered a cost control program for the design, tendering, and construction phases of the project. This necessitated Turner working with the architect and his consultants in order to assure that all design work met with the budget and design requirements. Turner also made comparative cost studies for using alternative construction materials.

By the time Turner started work, the design of the buildings was well along. Turner's first estimate exceeded the budget, so it began to work with the architect on changes that would reduce the cost. One major change concerned the seating, which was changed from curved rows to straight rows so that the precast concrete shelves supporting the seats could be manufactured at less cost. George Qualls, the architectural partner in charge, says that the recommendations did not compromise his design, and complimented Turner on its help.

is more costly, how do you know that the cost of concrete has not been inflated to the point where it is only an iota less than steel? It would be natural to do so," says Newman.

"When Tishman builds, the architectural, structural and mechanical systems are not predetermined by any individual or profession without regard to the market place."

Materials Manufacturers — Materials manufacturers are branching out. They are in the real estate and commercial building business. They have acquired major ownership in home building firms, and are also involved in urban renewal. How are they going to build? Are they going to use the consultant-contractor or the architect in their building ventures? Newman predicts that they are going to use both on their team. But if they develop their own competence, where is the architect and the consultant-contractor going to be? At present, the producers do not say because they still depend upon architects to write manufacturers' names into specifications, and contractors to use their products in an effective and efficient manner.

Newman's view is that with producers getting into building, with government getting involved with professionals in urban revitalization, and with contractors turning professional, there are more and more people, including sophisticated owners, who will affect the architect's decisions.

What Does the Architect Do? — "There is not a Tishman building on which we have not retained an architect, engineer, and attendant professionals," says Leonte.

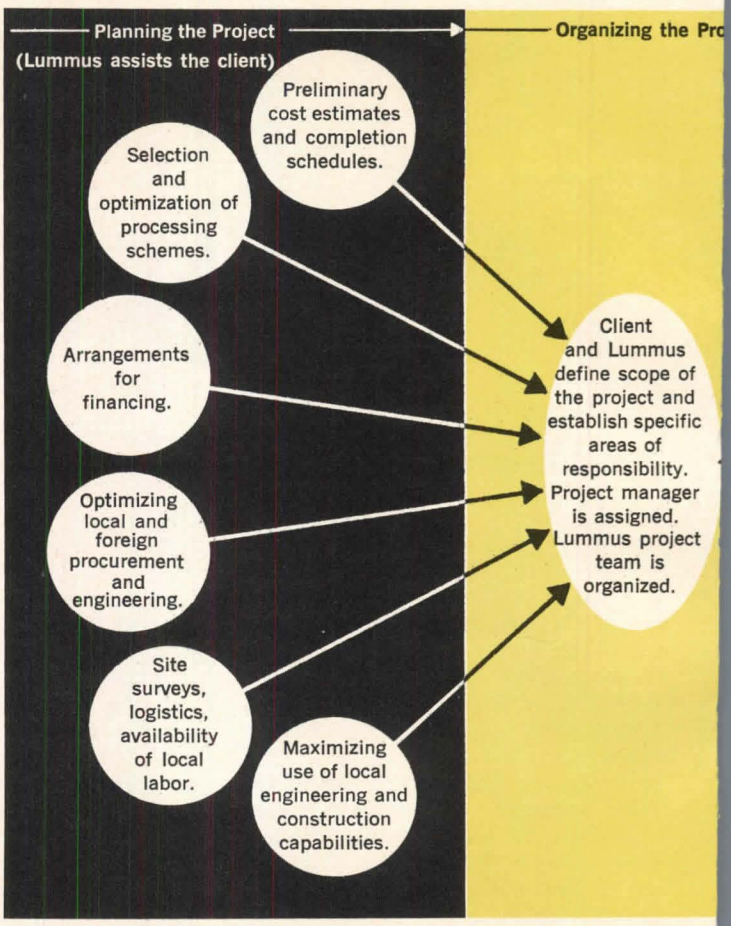
"We do not pretend to have their capabilities, but we can enhance their capabilities by optimizing their potentials through introducing them to the practical and economic aspects of building.

"No one has taken the architect's job away," says Leonte; "we have simply made it easier. Most architects who have worked with us, agree with us.

"Certain of the key architectural offices in this country have worked both ways: with construction managers and without. You will find that many architects assume the posture that best suits their client.

"If the architects can develop the competence to perform the function of the consultant-contractor or to manage the construction of a building, the owner who wants this competence will take advantage of it. The point is that this competence is necessary and desired. Who provides it or how it is obtained is secondary.

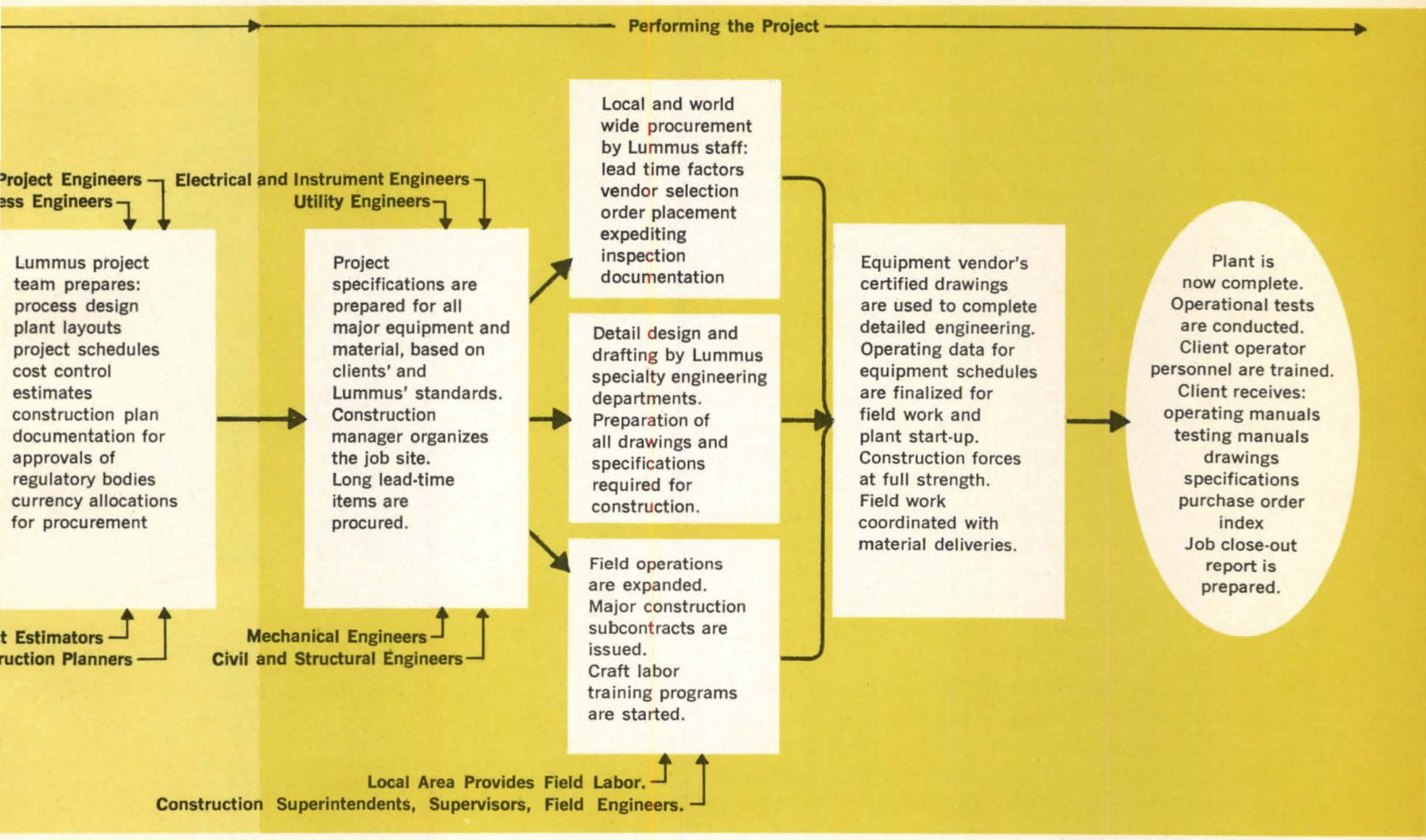
"With the growing needs, the problems in our society, and the complexity of building, there is no doubt in my mind that we have to work as partners on a team. But, in general, this has not happened."



Turnkey's Age-Old Threat

Package building by any other name would still sound far from sweet to most of the architectural profession. The other names most commonly used include design-construct firms, single responsibility contracts, and turnkey operators. For a long time, the buildings produced by these operations were considered inferior, and were equated in quality with mail-order prefabricated buildings that litter industrial parks and line the sides of highways.

Times have changed, however, and design-constructors have shown that they can successfully marry



Lummus statement of comprehensive services: "By assigning total project responsibility to Lummus for the study, evaluation, and planning activities and the subsequent engineering, procurement and construction phases, a better means is provided for achieving a successfully operating plant at the earliest completion date, and within budgetary requirements."

economy with quality. Even this observation may not be quite correct, because the old selling line "We can build cheaper" is not used by the major package firms any more. Instead, they point out that they can build faster, which, of course, interests a building owner who can start drawing rental or production income earlier than is possible with separate design and construction contracts.

Economies are available through package deals, but the savings do not necessarily get passed along to the client. Many of the arguments put forward by the package builders, such as better purchasing power through buying large shipments of materials or products, also apply to general contractors who stand to make the same savings. So, unless the client is paying for the job on a cost plus percentage or fee (which the package builders seldom do), he does not get too much advantage from that inducement.

Design constructors make a formidable showing on the annual listing of top design companies compiled by *Engineering News-Record*. In a May 1968 list of 47 design constructor firms, the top one grossed $1,363,000,000, the lowest grossed about $30 million. It is not clear how much of the income is derived solely from design work, since the firms report their volume of design and construct together with design-on-

ly contracts at their in-place value. Nevertheless, the total of general building and manufacturing plant design that did not get to consulting architectural offices is quite significant.

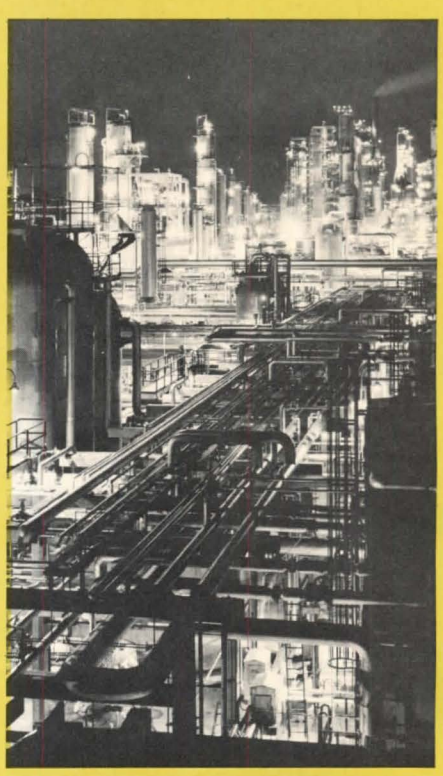
Most of the design construct work is for industrial clients who have a hard-nosed approach to the financial aspects of a contract. These clients do not respond to the claims of professional integrity that an architect can give to a church committee or a local school board. Hence, an industrial client warms to the idea that if a $5 million building is to be paid out in 10 years, he can gain $250,000 if a builder can complete the project six months earlier than some advisers thought possible.

The only builder who can make such guarantees is a company that works so closely with the design firm that it can start site work long before the working drawings are completed, and at the same time not worry about the additional costs that may occur if the designer makes changes in the plans. This is the type of cooperation that exists within a design construct firm, and this is what makes the package attractive to businessmen.

Accurate Estimating Wins Clients — Package builders offer expertise in estimating because their own construction departments prepare estimates from the design group's preliminary drawings, and later can confirm this in the working drawings. Since many design construct firms also take on design-only commissions or serve as general contractors for jobs they did not design, they have a good opportunity to compare the accuracy of their estimating skills with other firms.

Many are proud of their estimating records, and a little skeptical about the efficiency of estimates drawn up by consulting architectural firms. They say that architectural firms frequently underestimate the true cost of a project by as much as 40 per cent. When estimates are too far out, an architect's office costs rise considerably because the client demands the building be redesigned to meet his budget. With package builders' estimating skills, the estimated cost averages about 7 per cent under the final cost.

There may be an ethical implication in architects' estimates being so far from the true cost of construction. If a client assigns a sum of money for a project and the architect knows that his design cannot be built for that money, he may be tempted to tailor the estimate to fit the budget. Then, when the construction bids come in much higher, the client may be so

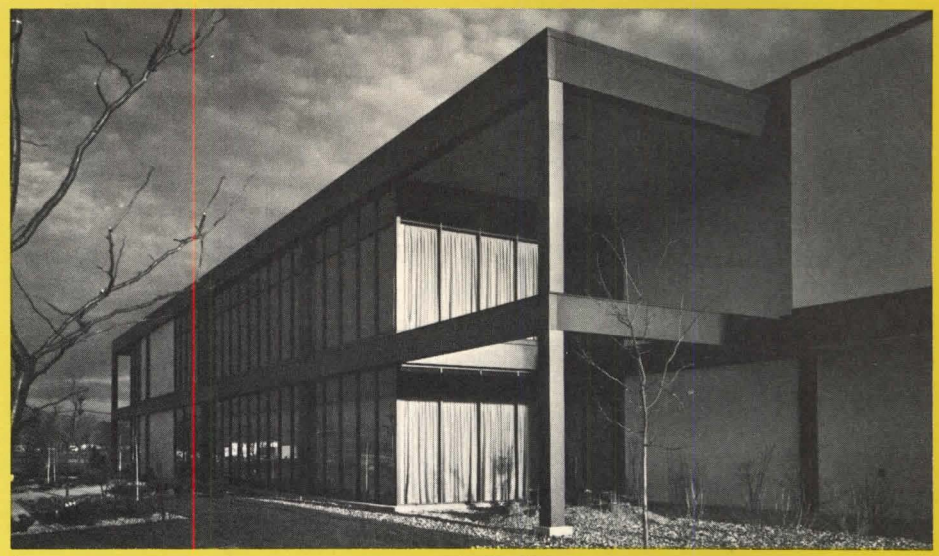


Night view of a desulphurizing plant designed and built by Braun.

Braun Owns $3.5-Million Computer and R & D Centers

C.F. Braun, package builder, owns a $1.5-million dollar data processing center and a $2-million research center. With more than 1100 professional and administrative personnel, Braun's services include conceptual design, "architect engineering" [sic], project management, consulting research and development, and field construction. The firm offers both the separate services of engineering and design, project management, construction or consulting, and research as well as complete services for any project, "including process units, buildings, roads, and utilities." Braun's annual business totals $100 million, more than 90 per cent of which derives from planning, engineering, and constructing large industrial projects including administration buildings, cafeterias, and control buildings. The other 10 per cent is in consulting, economic studies, research and development.

Office and lab building for Chanel, Inc., designed and built by Kidde.



Package Design Can be Good

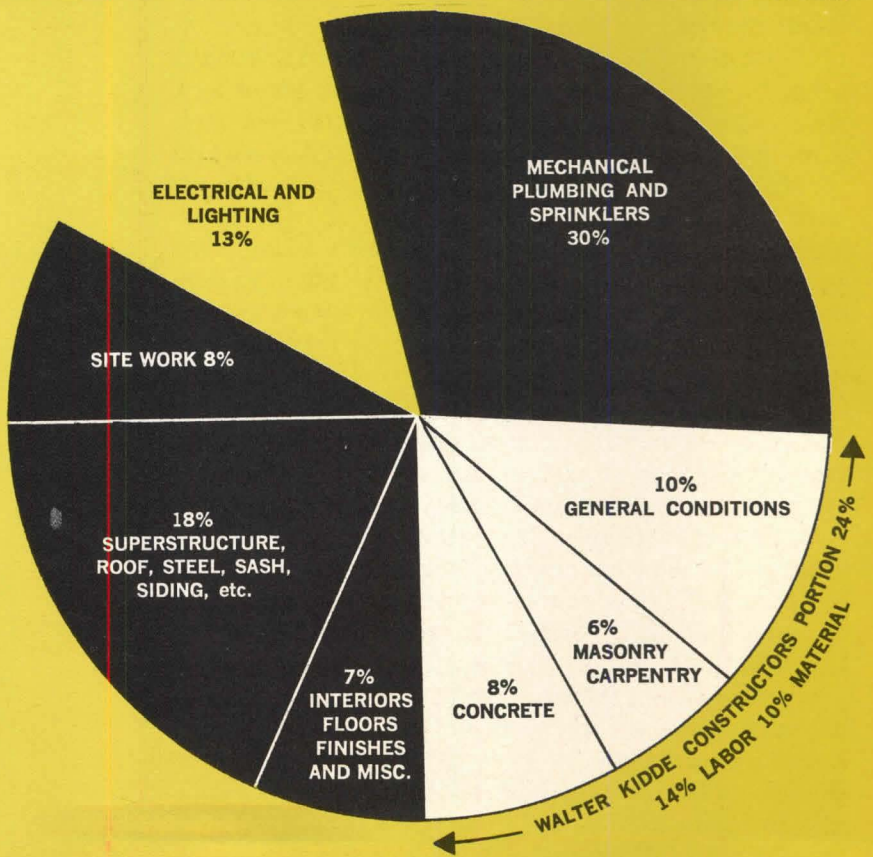
One of the big package companies in the general building field, Kidde Constructors, Inc., which is part of the giant Ebasco Industries, Inc., splits its business three ways, and gets 25 per cent of its revenue from design only, 25 per cent from build only, and 50 per cent from design and construct contracts.

Ebasco, a corporation with a net annual income of $23 million, owns two other design construct companies: Chemico, specializing in chemical plants, and Ebasco Services serving the utilities field. It also operates EBS Management Consultants which, among other services, makes feasibility studies for transportation projects. Ebasco also owns manufacturing industries, and utility companies in South America.

A Kidde brochure states, "We bring more total experience and resources to your job than any other firm." And the company's services do not stop at industrial buildings. The same brochure states, "We can also help you master-plan your facilities — from a single building site to a multistructure complex, from an industrial park to an urban center, or even to an entire regional development plan or transportation system."

One more Kidde quote tells of the influence large corporations exert on government: "In at least one case — education — our efforts have led to legislation providing Federal support for planning purposes."

Some package builders are interested in small design projects. Frank L. Whitney, a registered architect and engineer who is president of Kidde Constructors, says that although his company is structured for large dollar volume jobs, it now has a $900,000 job which he believes the firm is doing as efficiently as an architectural consulting firm could do. But Kidde has a minimum limit below which it will not handle jobs. In contracting, it would refer a client to a small general contractor if the cost were below about $500,000. But with design only contracts, Kidde will take on any size project. Naturally, it would have to charge a higher fee for small jobs than for large contracts because the office cost is higher, expressed as a percentage of construction cost, than for large jobs. This, says Whitney, is because he has to use the same design talent for a $500,000 job as for a $25,000 project.



ANALYSIS OF CONSTRUCTION COST FOR AVERAGE INDUSTRIAL PLANT:
EXCLUSIVE OF ALL FEES AND ENGINEERING COST

committed to building the project that he will raise the additional financing.

So the package builder offers the client a faster job and a more accurately estimated design. It also offers services that many architectural offices cannot provide. Because of the large size of its operation, the design builder has in-house consulting services that range through financing advice, site selection, marketing analyses, soil testing and construction management. Furthermore, many package builders are part of a large parent corporation that offers considerably wider services.

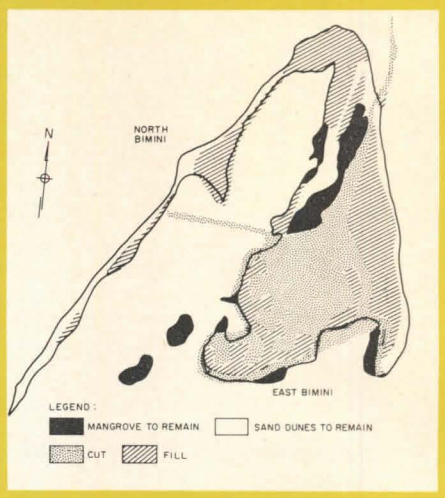
Profit vs Fee — Relations between the architectural profession and the integrated design-build firm have been, to say the least, uncordial. Twelve years ago, when the AIA Package Deal Committee first met, some members said, "Let's outlaw these dealers and build a legal framework around them that will put them out of business."

But one committee member, Vincent Kling, was more realistic in recognizing that "the package deal operation is filling a sort of vacuum for which we ourselves were perhaps responsible. Maybe we have been blind to our opportunities."

In the last decade, the influence of the integrated design build firm has grown, and the architect may be still blind, or at least suffering from poor vision, to the opportunities for combining design and construction management in a single professional organization. The arguments put forward by architects against the design-build firm center around the assumption that it is unethical to combine the design function with building construction. By this, they mean a conflict of interest must exist when a designer not only selects the materials and equipment, but also negotiates or bids for the construction, and purchases the labor, materials, and equipment for resale at a profit to the owner. Thus, the design-build firm "makes a profit" instead of a fee, and will bid for design commissions along with construction contracts.

Certainly, the growth of the design-build firms strongly suggests that many clients prefer the design-build firms' comprehensive service to the services of the professional architects. From this, it appears that the client may be accepting the design-builder as one type of professional.

The companies reinforce this belief by maintaining professional standards and offering consulting services equal to non-building firms. However, their view of the future of the architectural profession is



Conglomerate's Turnkey Rehabilitates Offices

Rust Engineering, a package builder that is a division of Litton Industries, recently acquired Barber-Cooper Associates, architects and planners. The acquisition brought 40 professionals to Rust's "general planning" staff of 20, thus enlarging the company's potential markets. The planners and architects are already working on several large-scale projects, including a total redevelopment study for the Island of Bimini, a railroad relocation study for seven railroads for the Civic Center Authority of Birmingham, Alabama, and design of several "planned communities" near Birmingham.

Rust recently announced another new and expanding service, called Operation Face Lift. For what it believes is a potential billion-dollar market, Rust will buy and rehabilitate old office buildings. The move is seen as "offering a huge potential for designers, constructors, and building supply and equipment manufacturers."

In addition to architecture and planning services, Rust offers an unusually interesting range of other professional services, including analytical reports in systems engineering, economic research, market studies, plant layout studies, and site evaluation as well as construction and engineering management and air and water management (for clients' problems with waste disposal, water supply and pollution control).

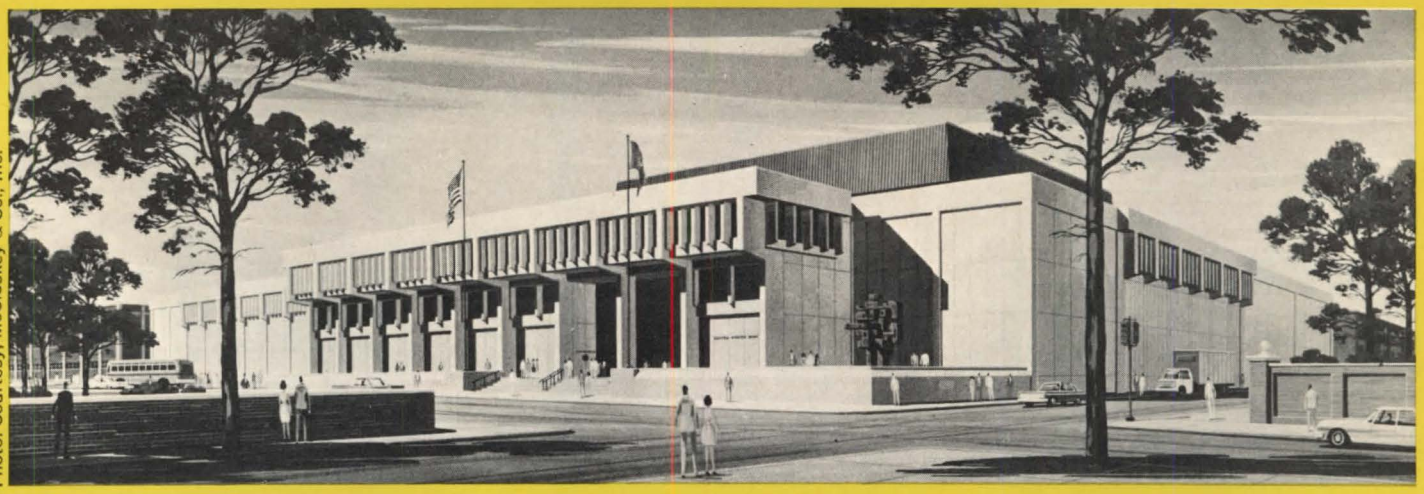


Photo: Courtesy, McCloskey & Co., Inc.

U.S. Mint, Philadelphia, designed by Parsons in association with Vincent Kling

Package Builder Hires 'Name' Architects

Two design construct companies reportedly earn over $1 billion annually; one of these is the Ralph M. Parsons Co., with headquarters in Los Angeles. Seven subsidiary companies located in the U.S., Europe, and Asia contribute to the total income which comprises design construct contracts, design only, and construction only contracts. Because Parsons is a private company, it does not divulge its income. However, within the industry, the word is that revenues total more than $1 billion. To handle its large volume, Parsons employs 3800 architects, engineers and scientists, and a field force of several thousand that varies with the work load.

In addition to the usual planning, engineering, procurement and construction services, Parsons offers its clients operation/maintenance systems analysis, human factors engineering/personnel activities evaluation, training aids and technical manuals. So, for advanced technological projects, such as aerospace facilities and missile silos, Parsons can design the facilities and teach clients' staff to operate them.

Parsons also designs buildings, but usually in association with a consulting architectural firm. It applies its wide experience in designing industrial process plants to gain contracts for hospitals, airport terminals, and broadcasting buildings. Usually, Parsons selects an architectural firm to associate with on a design contract and offers the team for the client's approval. A subsidiary of Parsons, Parsons-Jurden Corp., of New York City, specializes in metallurgical facilities, so it was suited for designing the New United States Mint in Philadelphia. For this contract, Parsons designed the processes and invited Vincent Kling to design the building. Similarly, it associated with Minorou Yamasaki for the Civil Air Terminal in Dahran, Saudi Arabia.



Green Tree Elementary School, West Bend, Wisc., designed and built by Marshall Erdman

Architect Designs and Builds Economical Schools

Not all design-build companies are large, but, to survive, they must be efficient. One small company founded by an architect, Marshall Erdman & Associates, Madison, Wis., builds schools for as little as $13 per sq ft. The cost, of course, is guaranteed with the initial contract, and much of the economy is obtained through prefabrication of standardized components. Erdman works to a 4-ft module with 9-ft-high ceilings, and if a school board demands too many variations from his standards he will recommend the board to a local architect and a competitive bid contract.

Construction costs can be kept low by bulk buying components or products for a whole year's work at one time. Since most of the firm's work is schools and medical buildings, it is not too difficult to purchase items, such as hardware or windows, that will suit all the projects in one year. Another economy accrues through manufacturing units in a shop so that workmen perform site work at 90 per cent efficiency compared with conventional field construction of 40 per cent or less efficiency.

In the dual role of designer and contractor, Erdman can control costs, and his goal is to control 70 per cent of the cost of materials in a project. To achieve this, subcontractors will have to order products such as air-conditioning units through Erdman's warehouse even though the sub takes the profit.

not warmly appreciated by that profession. Many of the principals of package firms seriously believe that architects will have to integrate with contractors or construction consultants within the next decade.

The Architect as Agent — To assume that the design-build operation is always going to create a conflict of interest is to misread agency law concepts. Agency law does not require that an agent only receive his compensation from the principal (as the AIA Standards of Professional Practice erroneously state). Rather, the agent is bound to disclose his sources of income other than from the principal, and if the principal consents, no conflict of interest can exist. For example, if a design-builder agrees to work for a fixed fee plus costs, it is very difficult to say that he is not an agent with a duty to account for any other profits. If this agency relationship were not assumed, then the design-builder would have no such duties. In brief, there are certain situations where it is essential for the design-builder to be a professional agent, but other situations exist also.

The core of the architects' argument against the design builder is actually based more on economic competition than on ethics. The architect mistakenly assumes that his self-serving Standards of Professional Practice are a code of ethics when actually they are more like the trade restrictions of many nonprofessional as well as professional associations. So far, the architectural profession has not asked an outside organization to compare quality of services of the design-builder with those of the separate architect and builder. Instead, the architects have only reacted defensively to the sting of lost commissions resulting from successful design-build competitors.

Another bitter pill that architects must swallow is knowing that many design builders enjoy their reputation because they consistently produce quality facilities in a professional manner. Many of them enjoy a large number of repeat clients.

To the relief of the architectural profession, the package firms at present only want the big jobs. That leaves 80 per cent of the profession in firms no larger than five men to work on the multitude of small commissions. But what will happen when the giants multiply and run out of large scale projects? Will they start scrambling for the "crumbs"? Or will they pick up small jobs just to keep the staff together no matter if there is a profit or not?

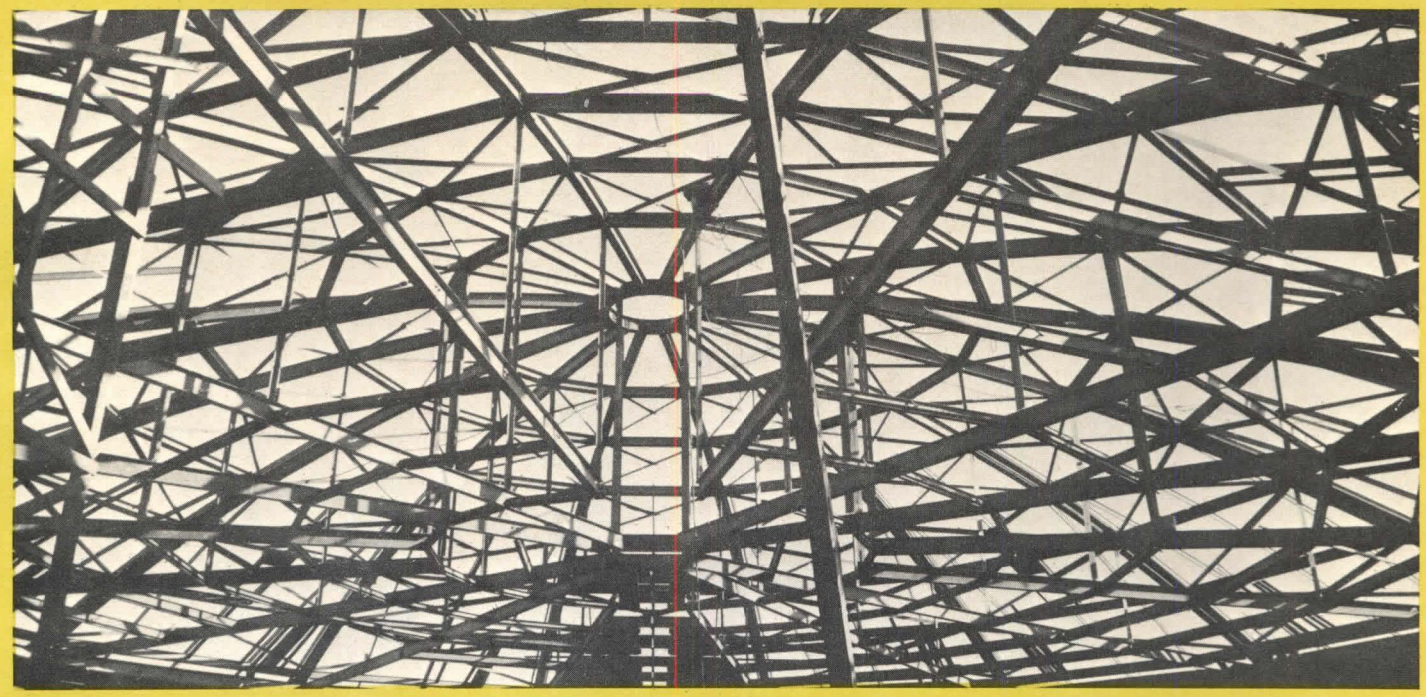
From among the numerous design-construct companies, P/A has selected a few to illustrate the size and resources of the firms competing for architectural contracts.



An ammonia plant designed and built by Lummus recalls the imagery of the Metabolists and Futurists.

Lummus Offers Wide Range of Services

The Lummus Company, employer of more than 4000 engineers, scientists, technicians, and administrators, is an international engineering and construction organization with 15 offices and subsidiaries around the world. Lummus mantains a $10 million inventory of tools and construction equipment and has world-wide procurement ability. Lummus clients are drawn from the chemical, agricultural chemical, petroleum and petro-chemical, food and pharmaceutical, metallurgical, pulp and paper, synthetic fibers, resins, and plastics industries. The company works on a variety of contractual bases, ranging from turnkey lump sum to cost-plus. Of most interest to architects, however, is Lummus' list of services, including: master planning, conceptual and feasability design, engineering development and research, commercial and financial planning and assistance, construction management services, and total project execution.



Roof framework for "launch-phase simulator facility" at Goddard Space Flight Center, designed by Gibbs and Hill.

A-E Firm Gains Financial Strength From Merger

In 1965, Gibbs & Hill, one of the largest architectural and engineering firms in the country, merged with the Dravo Corporation, a $300-million diversified construction and manufacturing firm. The result of this marriage is that, today, G & H is one of the largest package builders in the nation. Among the advantages of the move for G & H were access to Dravo's financial resources and the ability to obtain marketing information, personnel management, and new business. But the most important advantage is that G & H can now obtain top level management advice not normally available to A-E firms. The president of G & H cautions A-E companies intending mergers, against merging with a conglomerate that manufactures equipment or materials that could be incorporated into design work. G & H services now range from studies and reports through design to construction, and from consultation on engineering problems to complete project responsibility.

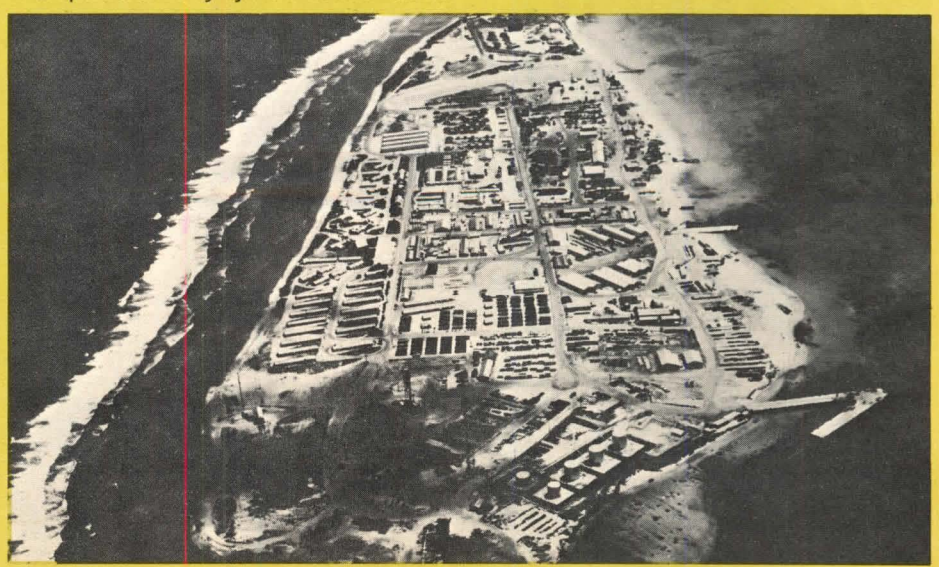
Reflecting the current trend toward comprehensive services, G & H is developing "an effective and interdisciplinary systems-engineering approach to problem definition and problem solution." What an A-E firm that was small — compared to its new owner — will develop into with access to Dravo's 16 divisions and subsidiaries will be interesting for the profession to watch. Among recent projects, G & H lists the design of transportation systems for metropolitan regions.

Former Engineers Now Design and Manage

Design construct firms usually offer management services in a wide field of activities. One firm that spreads its interests, Holmes & Narver, Inc., of Los Angeles — "The unusual we welcome, the impossible we enjoy" — ranges through management contracts for underwater operations, shipping, scientific missions, community services and hazardous project control.

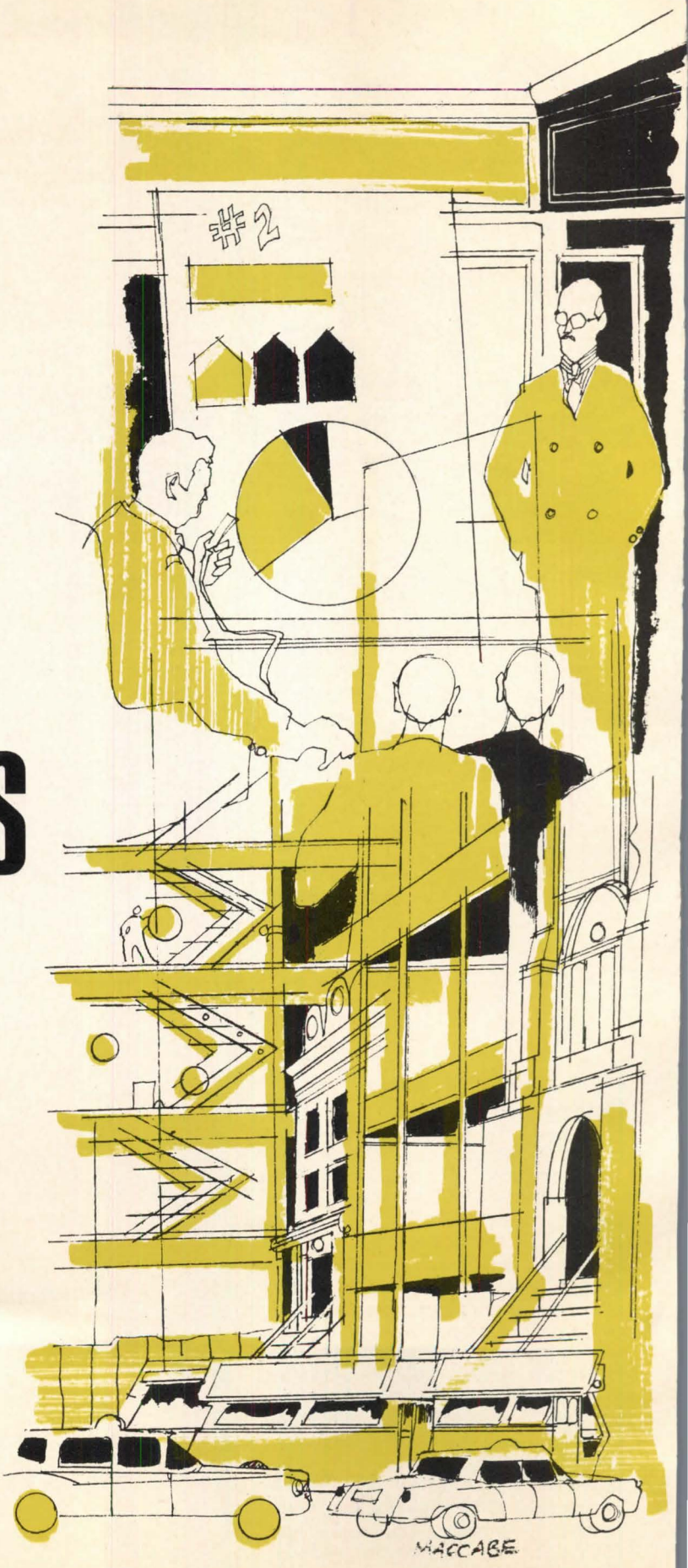
Holmes started as an engineering firm, but now provides "a complete professional service to clients who prefer a single management responsibility for major industrial, public or defense facilities." Four divisions contribute to contracts of $220 million annually: Advanced Technology, Engineering and Design, Turnkey Construction, and Management and Operations.

Parry Island (in the Marshall Islands) proving ground "designed, built, fed, managed, and operated totally by Holmes and Narver."



CORPORATIONS AS NEW MASTER BUILDERS OF CITIES

With services from pre-design through design, manufacture, and construction, corporate giants such as General Electric and Boise-Cascade will revolutionize the building industry.



The Humble Oil Company, General Electric, Westinghouse, Kaiser, Walt Disney Productions, and Alcoa are a few of the corporate and conglomerate giants that are committing tremendous amounts of capital to help create new cities and renew old ones. These corporations have joined the package builders, consulting engineers, management consultants, research firms, large A-E firms, and independent consortiums of experts, such as Stewart Udall's Overview group, (p. 45, MARCH 1969 P/A) in the competition for the environmental design field.

So it is not only the "new professional" educated in the nonarchitectural disciplines, described earlier in the issue, who will create the environments of the future, but another group with much larger capital and expertise in management and marketing.

The new corporate master builder seeks, through both internal expansion (hiring of architects, planners, and real estate experts) and external acquisitions of already successful builders, to erect whole new cities or cities-within-cities that will be built and wholly owned by the corporation.

Government has already indicated that corporations would compete for contracts to build 250,000 to 350,000 low-cost housing units a year. George Romney, Secretary of HUD, said last March that corporations such as Alcoa, GE, US Steel, Boise Cascade and Fruehauf Corporation could act as possible contractors.

Earlier in this issue, Frank Hotchkiss, an architect with TRW, explained that some of the efforts of the new professionals are being applied to changing the rules of the game, which means changing the governmental and fiscal policies that predetermine what, why, where, and when the urban process, architecture, and the building industry gets changed. In the following pages, P/A reports on several of the directions giant corporations are taking in their effort to participate in the building industry on a grand scale. But at least one corporate giant, GE, has, for the moment, decided to expend its efforts in getting the rules changed — specifically, Federal and state legislation governing land developments (see following pages).

Industrial Homesteading — A GE analysis revealed that profits are too small and costs too high for massive community development, and many businessmen evidently agree. Industrial lobbyists such as the nonprofit committee for National Land Development Policy, comprising builders, bankers, and sociologists, are now pushing the Nixon Administration for approval of the Industrial Homestead Act. The new act, which is meant to stimulate the building of new towns by private corporations, resembles the Republican party's Homestead Act of 1862, which provided for the allotment of unoccupied public land to homesteaders on the payment of a nominal fee after five years residence. Under the 1969 Homestead Act, as described by Joseph Timan, Chairman of the Committee and President of Horizon Corporation (developer of large communities in the Southwest): "Industry will acquire title to the land on which it builds plants. Individuals and developers would acquire title to the land on which they build houses. The new cities thus created would be favored with tax incentives, government contracts, and Federal building programs."

So far, little has been done to prevent corporations from enforcing their idea of what a new city should be.

The new act seems to call for a system of public land ownership as exists in the Soviet Union, where ownership of all land by the government permits city planners to draft comprehensive plans for development of large open spaces. But what is now beginning to occur in the U.S. is that, instead of city planners or government planners drafting comprehensive plans for new cities, corporations are attempting, through legislation such as the new Homestead Act, to assume that position. So far, little has been done to prevent corporations from carrying out and enforcing their idea of what a new city should be — even without fancy legislation or the Government giving land to them.

Will Industries Move Out of Cities? — The committee estimates the initial government outlay of money, in addition to the donation of public land, would be $50 million for planning, site selection, and build-

Continued on page 154

A $380 MILLION MARKET PLACE

I. BASIC SHELTER DOLLAR

For basic shelter, Boise Cascade offers the following:

A. BOISE CASCADE BUILDING COMPANY, formerly R.A. Watt Co., which builds on-site residential homes.

B. PERMA-BILT ENTERPRISES, INC., part of Boise Cascade Building Company.

C. URBAN RENEWAL
Projects in:

- **Boston**
- **Baltimore**
- **Indianapolis**
- **Long Beach, Calif.**
- **Pittsburgh**
- **San Francisco**
- **Harlem**

D. INDUSTRIAL PARK DEVELOPMENT AND CONSTRUCTION
Greater Los Angeles Area and San Francisco Bay Area

II. DISCRETIONARY SHELTER DOLLAR

For secondary homes, Boise Cascade offers the following:

A. OFF-SITE CONSTRUCTION
1. Kingsberry Homes (factory-built homes).

2. Kingsberry West Division (formerly called Component Division).

B. MOBILE HOMES, TRAVEL TRAILERS, specialty vehicles, buses, etc.
Divco Wayne Industries, Inc.

C. RECREATIONAL LANDS AND LAND DEVELOPMENTS.
1. Lake Arrowhead Development Co.

2. Pacific Cascade Land Co.

3. United States Land, Inc.

4. Princess Cruises.

(NOTE: Shelter gross sales in 1967 were over $200 million; in 1968 they were over $315 million; Boise Cascade projects a 20% rate of increase in 1969).

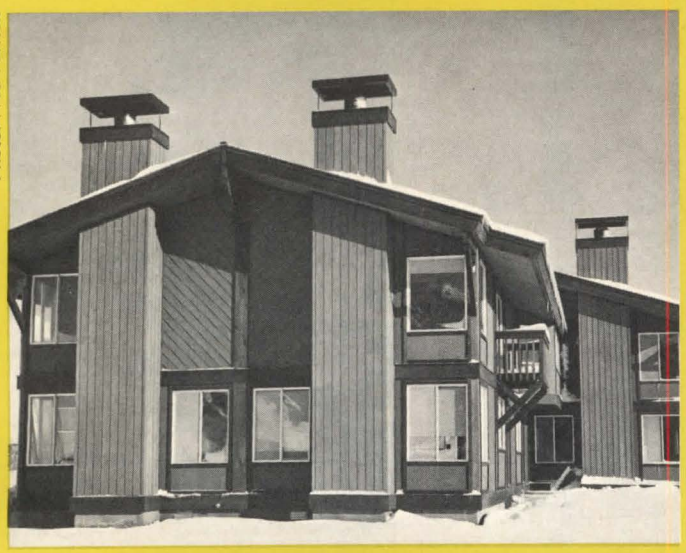
Vertical Diversification: From Trees to Houses

If relatively small corporations of design-builders threaten the professional ethics and standards of architects, how is the next generation of architects going to respond to future giant pre-design, design, manufacture, and builder-conglomerates? The profession has not long to decide, because in March 1969, Boise-Cascade Corporation (BCC), a billion-dollar conglomerate and largest manufacturer of single-family houses in the country, announced it was merging with Ebasco Industries, Inc., another giant conglomerate that owns three large design-construct companies (see p. 145), a management consulting firm, and manufacturing and utility companies.

If this proposed Boise-Ebasco merger is realized, it would be among the more spectacular of such unions — possibly on a par with Luckman's prophetic leap into the Ogden Corporation. Although the issue of professional ethics is not involved in the Boise-Ebasco merger, as it seemed to some to be in the Luckman-Ogden move, the former has perhaps more bearing on the future of architecture than the latter.

Since 1957, when it was organized as a combination of three ailing lumber companies, the Boise-Cascade Corporation has expanded into the "shelter" and land development markets. With 27,000 employees and seven major markets or corporate divisions, Boise-

Photo: Fred Farrish



Boise's discretionary dollar shelter group builds prefabs . . .



And its basic shelter group builds traditional houses.

Cascade started with a management orientation to stay in lumber-related fields, beginning with paper products, then on to packaging, then to building materials made of wood, then to housing, and recently, through acquisition of an urban renewal contractor, to urban redevelopment. But along the way diversification fever struck, and BCC bought a recreation company, an office products company, and several others, so that, today, its products range from urban renewal projects to funeral coaches.

The growth from a $34 million to a diversified, billion-dollar corporation has been accomplished primarily by mergers and acquisitions of companies already well established in markets Boise sought control of. BCC does not want to be pigeon-holed as a conglomerate, however. Robert V. Hansberger quixotically explained how Boise found itself in unrelated fields: "If you grow into things that are akin to something you are already in, the ends of the growth are more and more diversified."

Boise entered the field of recreational land development in 1967 with the acquisition of the United States Land Company, the "water-oriented" division, specializing in the development of lakefront resort communities near metropolitan areas. In the past four years, U.S. Land has developed five recreational communities with a total of 10,500 acres. In addition, Boise purchased the Lake Arrowhead Development Company, a real-estate firm selling unimproved lots around Lake Arrowhead where the company owns a golf course, a public water system, several hotels and other buildings.

BCC also acquired Kingsberry Homes, a manufacturer of prefabricated homes with factories in Alabama, Iowa, and Virginia. This subsidiary has been described by the Equity Research Associates as a leader in developing standardized components and systems and using a wide range of materials, designs, and building techniques.

In 1966, Boise-Cascade acquired a 50 per cent interest in the R.A. Watt Company, a residential home builder with $36 million in gross sales on 2800 units in 1967. Watt's volume makes it a direct competitor of such major companies as Levitt and Kaufman & Broad. In addition, Boise complemented the Watt operation by purchasing an interest in Perma-Bilt — a large tract home developer in the San Francisco area. R.A. Watt now expects to expand operations nationally, depending on whether management can obtain its share of massive Federal subsidies for the industry. Raymond A. Watt, chief executive officer of the R.A. Watt Company, is awaiting Congressional confirmation of his appointment as an Undersecretary of the U.S. Department of Housing and Urban Development.

In 1966, Boise decided to capitalize on the unexplored black market by acquiring a black construction firm to perform urban redevelopment work in the nation's ghettos. Accordingly, the brochure of Winston A. Burnett Construction Company of New York, Inc., proclaims: "We believe that the construction industry can wage and win the war within. We believe that the construction industry, in concert with and supported by a morality that discards outworn concepts of incompetence and second-class citizenship, can replace such outmoded ideas with partnership, joint venture, and brotherhood in solving the problem of our urban centers."

With building materials, building products and components, and manufacturing technology all under one roof, Boise has the opportunity, long awaited in the home-building industry, of standardizing components and turning it into a true manufacturing industry. With the rising costs of skilled labor and materials, the shortage of labor, a depressed economy and tight money, and with the already crucial need for new housing construction, small builders will be hurt. At the same time, giant corporations that have the financial resources to introduce new technology and standardized components that will eventually drive out the older and smaller companies.

ing the infrastructure of each new city. Since the government would designate sites, this would offer continuing economic advantages to industry, because it would eliminate many of the cost considerations of seeking new plant sites. Corporations require incentives (which amount to subsidies) before they will undertake large-scale city building projects and be assured of a minimum 15 to 20 per cent return on capital within four or five years.

If the new Homestead Act is passed, the result would be a mass exodus of industries and people from the already tax-poor cities, leaving the inner city to rot. Government incentives, such as the ones proposed in the act (as well as in the Department of the Interior's multiple use policy; see page 158), would simply mean that the Government had decided to give tax-payers' money to the middle and upper classes to help them escape the cities. The low-income wage earners would remain, since they are already rent poor and would not be able to buy, let alone build, their own houses outside the city and commute to work.

Timan has recommended that the new cities should be completely preplanned and built in sparsely settled areas of the country, supposedly "to divert a large share of the exploding urban population away from the crowded, slum-ridden older cities, giving them time to heal themselves and rebuild for the 21st Century." But if Government money and private money is spent on the new cities, who will be the healers of the old ones?

Instead of using their systems technology to delicately orchestrate a systematized surgery to save existing cities, a few corporations want to get out. Nevertheless, many remain. Monuments to corporations are changing the city skylines and are fortified by cultural and architectural moats that protect them from the cancerous growth of the slums.

The new cities should be completely preplanned and built in sparsely settled areas.

GE Quits City Building

In February of this year, The General Electric Company announced the dissolution of a corporate division, called the Community Systems Development Division, set up in 1964. Based in Los Angeles, a staff of 12 architects, planners, and related professionals, headed by architect Albert Trevino, had explored for two years how GE could enter the land development business by building several cities.

The document reproduced here represents nearly the entire text of a statement sent to P/A by General Electric that is intended to explain the company's motivations for both entering and quitting the field of city building. It is an excellent example of the modern corporation's thoroughness, both in the scope of the work carried out, and in giving important work to "new professionals" such as Trevino.

In the light of this document, GE is presumably lobbying in Washington to get the rules of the land development game changed. Some of the recommendations in the following text, if Congress were to enact them, seem rather ominous. One is that corporations should have the right of eminent domain — a right which, traditionally, has been jealously guarded by governments, and one that, if granted to corporations such as GE, might in some ways make that corporation more powerful than the states of Texas, California and New York combined, since GE's annual corporate expenditures, over $8 billion, are about equal to the expenditures of all three states.

These are some negative features of the document. However, as a summary of land development and the problems facing our urban centers, the document is unquestionably revealing.

Summary of General Electric's Planned Communities Study — Acutely conscious of the growing problems of the urban environment and the increasing need for more and better housing, General Electric, three years ago, announced a new Community Development Division to undertake land development on a city scale. After an appraisal of the situation at the time and under existing circumstances it seemed that this was a reasonable direction to take, for the following reasons:

New construction represents a major market for General Electric products, and there was great concern for the future prospects of the industry.

Building had been on a plateau for more than a decade during a time of unprecedented prosperity. Housing was not maintaining its share of spendable income. Potential home buyers did not consider new housing a good value compared to vacations, boats, cars, and many other things.

The development and construction process failed to meet market demands and customer expectations due to a number of factors, including rapidly rising land cost: wasteful land use resulting from unrealistic zoning; archaic and non-uniform codes, which prevent the use of cost-saving materials and methods; runaway wage rates in the building trades; tight money and rising interest rates; and ever-increasing taxes.

The highly fragmented character of the building industry itself, combined with the before-mentioned roadblocks, made innovative design and effective cost reduction all but impossible. It was a situation to challenge the technical, financial, manufacturing, marketing and management capabilities of the largest companies.

It seemed entirely reasonable that a systematic approach to planning and phasing the construction of a new town from scratch could result in substantial savings in initial capital investment as well as reduce per capita cost of community services.

Perhaps a company such as General Electric could undertake the long-term development of a prototype community offering so much better environmental values as to set a pattern for future urban growth. But, whatever was done must be accomplished on a sound business basis and return profits equal to, or better than, the ongoing business operations of the company.

We diligently pursued our homework, and, with this background, began with a nationwide market study to identify potential sites where a new town of 100,000 or more could feasibly be developed over a 20-year period.

"Whatever was done must be accomplished on a sound business basis and return profits equal to the ongoing business operations."

"The highly fragmented character of the building industry . . . made innovative design and effective cost reduction all but impossible."

In addition, we developed a Critical Path approach to creating a city from raw land to completed development in the most efficient fashion, and undertook a study and comparison of housing construction techniques; participating in a contract with the Department of Defense to develop new concepts for improved military housing [see JUNE 1968 P/A]. To permit rapid financial and market analyses and to make valid comparisons and projections for potential new town sites, we created a very sophisticated computer program.

Having developed the tools to work with, in what is popularly called the "systems approach," it was quickly established that for a new town to be viable it required a balance of industry, commerce, and housing to provide employment opportunities, economic undergirding and low per capita tax costs. Also, a certain minimum size was necessary to support a public transportation system and all other desired municipal services in health, education and security — 100,000 population or more, requiring 10,000 to 15,000 acres of land.

To achieve completion in a reasonable time (20 years) required an atypical confluence of factors leading to rapid population settlement, i.e., new university, new industry, or new government facilities. The site location must be in a favorable political jurisdiction, free of onerous zoning constraints to insure marketability at a required rate. The site should be within 45 minutes commuting time to an existing city of over 1 million population; within 30 minutes of a jetport; within 20 minutes of a university; have excellent access by highway, rail and water, have ample water supply and good draining; and topography and geology which does not unduly inflate development costs.

Coincident to building a solid body of knowledge and criteria to optimize opportunity for successful development, a total of more than 30 potential sites were care-

fully inspected and analyzed. Only three or four were of sufficient interest to warrant intensive effort toward land assembly and organization. Unfortunately, for reasons beyond our control, the first project has yet to materialize. Failure has been due to various causes, ranging from political difficulties, to broken agreements, to the unaffordable cost of suitable land having the necessary qualifications.

Building a new city from start to finish on the scale contemplated has not been done by any private developer. Most all attempts are foredoomed to failure unless very unusual conditions exist in relation to the ownership and control of land, or institutional financing is obtained for 100 per cent the land and development cost. The latter can be obtained only by sacrificing a major share of equity and profit.

Long-term development incurs high risk and long-term payout, which must be offset by low-cost land or special financing — both now difficult to obtain. To have any chance of benefiting from the values that he creates, the developer must control a large land area, and that involves carrying charges of no less than 10 per cent to 12 per cent per year compounded (without taking into account current inflation of 4 per cent annually). To stay even, land must double in value every five years. The scheduled marketing rate is critical to profitability and any short-fall will bring financial failure, as so many community developers have already experienced.

Projects of a city scale require large front-end investments for seven or eight years; move into a profit position about the tenth; return investment in the twelfth or thirteenth; and throw off most of their profit during the final 7 years of a 20-year program. It is patently a complex undertaking and to be pursued only when all factors are favorable.

"It makes sense that the power of eminent domain must be granted to private corporations or to State Development Corporations."

There are also many problems beyond the control of private enterprise and which depend upon governmental action for solution. Until there is progress in this sector, new communities will not rise and flourish. It just makes sense that the power of eminent domain must be granted to private corporations or to State Development Corporations, in order to assemble land in the right location, and to take advantage of existing and planned public investment in highways, waterways, water work, sewage disposal facilities, airports and railways.

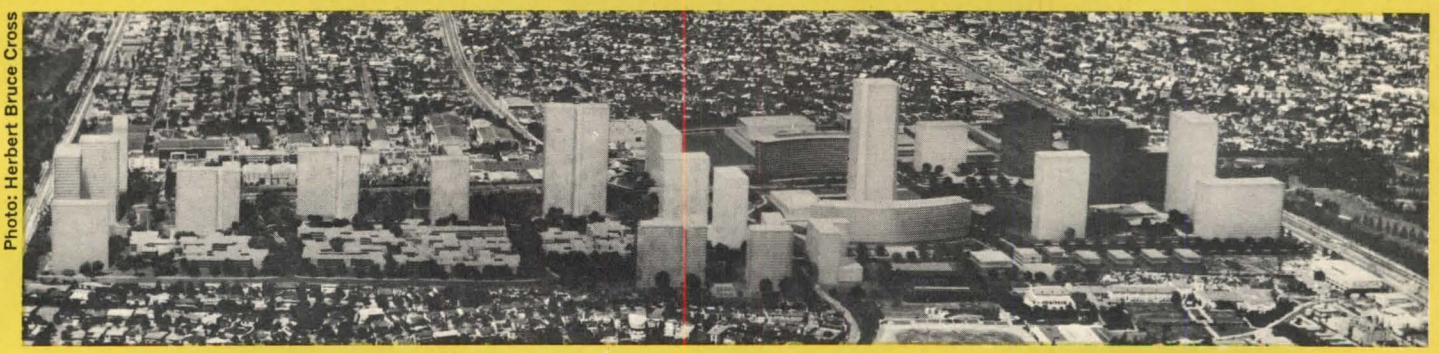
Perhaps something similar to urban renewal must be created, whereby land is assembled, master-planned, zoned and resold at a write-down to private builders by a local development authority. Tax restraint must be exercised to relieve the financial burden on the developer in the early stages; taxes can then be raised on a gradual basis after actual improvements are put in place.

At state level, legislation must be created that will permit the developer to retain a measure of control over planning, zoning, and community services for an agreed-upon development period, so that a dissident group cannot thwart financial planning or the very concept itself. States must establish grant and loan funds that can be used to match Federal funds in such areas as water, sewer and transportation systems. Physical structures and facilities should be provided which support public services in the community, i.e. town hall; fire, police stations; and schools.

Without a favorable political climate and without a way to circumvent the land speculators, community development on a city scale will succeed only under the special conditions surrounding the Irvine and Newhall Ranches, Leitchfield Park, and Columbia. Their successes are based upon low-land cost or unusually favorable financing.

Since our exhaustive study has indicated that the special conditions for success do not now exist, the development of new cities has been assigned a very low priority. General Electric, however, will continue to maintain an avid interest in this complex field and, should the proper combination of conditions ever occur, our involvement in the building and development of city-size projects could be reactivated.

Photo: Herbert Bruce Cross



Alcoa's 180-acre projected development of Century City in Los Angeles.

Alcoa Subsidiary Looks For Government Turnkey Housing

Alcoa, with its feet in aluminum production and its arms reaching out into real-estate developments constructed as much as possible with aluminum, is categorized as a vertically diversified corporation — one that has broadened its potential market by promoting its products. But Castle & Cooke, on the other hand, with capital investments in both real estate and macadamia nuts, is categorized as a horizontally diversified corporation — one that has combined a number of dissimilar "markets" or products under one central management. Both types of corporations justify the enormous capital outlays involved in land development as a means of broadening the total corporation's markets, testing and advertising products, and as immediate image-builders for the corporation as a whole.

Alcoa, through its subsidiary, Alcoa Properties, Inc., currently involved in projects under construction in 11 different cities, regards its land development projects as a means of promoting the uses of aluminum in construction — with an eye, of course, on sizable future income-producing real-estate holdings.

Its most ambitious project so far is Century City in Los Angeles, a 180-acre development that will eventually include more than 40 high-rise buildings housing a residential population of 12,000, and a working population of 20,000. Started in 1961, Century City is now about 25 per cent completed.

Recently, Alcoa announced that it was expanding its involvement in cities by forming another new subsidiary, the Housing Corporation of America (HCA), in cooperation with two developers from Miami, Fla. HCA will join with local and Federal Government agencies in the Government-sponsored turnkey low-rent housing program. Under the program, private developers and builders — HCA has a general contractor all lined up to do the work — build housing that is sold to the Government when finished and then rented out to poor families. One of the few programs to cope with the lack of decent low-rent city housing, the turnkey program's popularity with Alcoa is easy to explain. As John D. Harper, Alcoa's president, put it: "Alcoa's conviction is that real estate investments represent not only a sound diversification among activities which attain the company's primary goal of optimizing opportunities for profit and growth, but is an important approach to the fulfillment of its social obligation as well."



Townhouses on shore of artificial lake in Westlake Village, designed for American-Hawaiian by architect Richard Leitch and Associates.

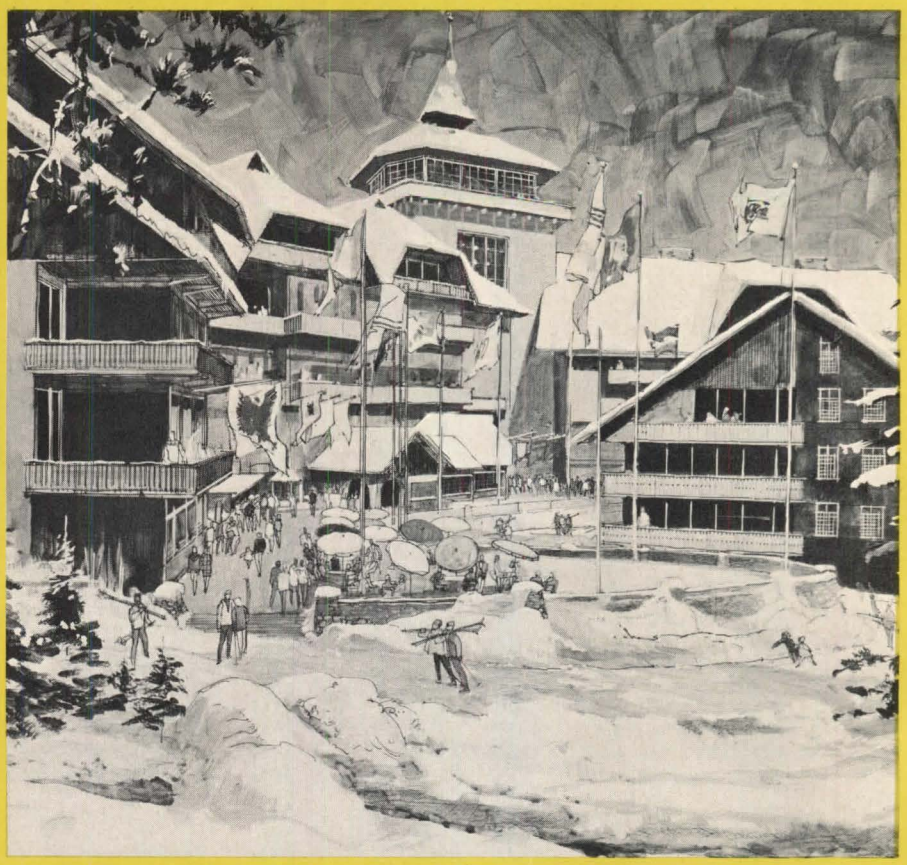
Steamship Company Builds Lakeside Village

Steamship companies are also diversifying into construction markets. American-Hawaiian Steamship Company has spread into real estate with a new division, American-Hawaiian Land Company. At Westlake, California, 38 miles northwest of Los Angeles, they are building Westlake Village, formerly the Albertson Ranch, a 12,500-acre "city in the country," having a projected population of 70,000 and scheduled to be completed by 1980.

Westlake Village is tantalizing "clean industries" to bring an employment base to this community of homes ranging in price from $28,000 to $74,000, and ranging in styles from "Cape Cod" to "Martinique" and "early California." Westlake's marketing strategy is to satisfy the desire for different styles of homes, including "contemporary," "traditional," "Spanish," and "something special" — "Westlake has them all." Many industries have already made the move to Westlake: Burroughs Corporation, Bunker-Ramo Corporation, State Farm Mutual Automobile Insurance Company, and IBM Corporation.

Like most developers, American-Hawaiian Steamship needs substantial seed money, and the Prudential Insurance Company of America bailed the project out of financial trouble in December 1968 with an investment of $50 million. Prudential supplied $30 million in cash and assumed the existing debt in excess of $20 million. Through this investment, Prudential has acquired a 50 per cent equity interest in Westlake Village, and gained, through the acquisition of real assets, an additional hedge against inflation.

NEW MASTER BUILDERS



"American-Alpine" village proposal by Disney for Mineral King Resort.

Disney to Build Experimental Community of Tomorrow

The generating economic core for new towns may be an industrial complex or unspoiled land that would attract future suburbanites. Or it can be a financially successful amusement park, especially if you happen to own Disneyland. Walt Disney Productions, Inc., has lately gone into the land development business through its subsidiary, WED Enterprises Inc. (the initials stand for Walt E. Disney). WED's staff includes architects, engineers, designers, and "technical craftsmen." WED proposes to build an Experimental Community of Tomorrow, EPCOT, in Florida as a "showcase of industry in the relaxed atmosphere of family fun."

EPCOT is strategically located in the center of the nation's number one tourist state. The new city will be designed and built by the same "imagineering" team that created California's Disneyland and will contain an industrial park, a residential complex of many scales, a jet airport, and an amusement park. This 43-sq mile parcel (twice the size of Manhattan Island) will contribute an estimated $150 million in sales taxes annually. This would be 17 per cent of the total revenues collected by the State of Florida.

The Disney Team — composed of "imagineers," and massive available capital — has designed a "showcase for American industry at work." Designed so that visitors can look behind the scenes at experimental laboratories and computer centers, EPCOT's industrial complex is nothing more than a marketing and advertising media for big corporations, presenting their products and their corporate image to millions of potential customers each year.

Another recent venture of WED Enterprises is Mineral King, a recreational resort development in the valley of the Sequoia National Forest, north of Los Angeles. Although conservationists are protesting the rape of 20 square miles of publicly owned virgin forest given to the "imagineers" by the U.S. Government, supposedly to "meet the public need by developing an all-year recreational program consistent with the area's natural beauty" and profit for Disney Productions, they have little chance of stopping the development. The reason is simple: WED Enterprises has added a new member to the Disney Team — the United States Government. The Department of the Interior has a "multiple use policy" that allows for the development of forests for recreational purposes. The policy allows private developers to erect a few scattered camp sites and pavilions on publicly owned land, but the master plan for Mineral King calls for a $35 million recreational resort complex for 1000 guests, restaurants, small shops, a conference center, and indoor/outdoor recreational units. Donn B. Tatum, the president of Mineral King, modestly termed the project "an outstanding example of cooperation between private enterprise and state and Federal Government agencies to meet an extraordinary public need." The State of California also welcomes the project because a report from the Economics Research Association, a consulting firm to the Disney organization, estimates that the state will accrue economic benefits totaling $500 million during the first 10 years of the project.

Manufacturer Builds City For Its Products

Until recently, Westinghouse Electric Corporation has only touched the construction market through its building products. However, the giant corporation, with assets of about $2.27 billion, announced the formation of a "new organization geared to meet the far-ranging needs of America's new breed of builders — the developers of new cities and major urban projects." As evidence that Westinghouse recognizes the new trend of corporations entering the building industry, the company plans to combine the capabilities of 32 divisions "to provide a single source for the widest variety of building products of any manufacturer in the nation." Its chain of command is quite complex: The field organization is composed of corporate construction representatives in 27 cities who will report to seven regional construction managers; these, in turn, are supported by construction engineers located in major market areas. The whole field organization will be supported by the new urban organization composed of city planners, systems engineers, market planners and promotion and new product developers.

Westinghouse's vice-president of construction, E. H. Seim, outlined the motivations behind the firm's move: "It seems clear that a new kind of developer is emerging whose plans will affect thousands of acres of land and hundreds of thousands of people."

At the same time, Westinghouse announced the acquisition of a Florida home builder, Coral Ridge Properties, Inc. The corporation will use Coral Ridge to help it in developing a "Total Electric City" for 60,000 residents on 10,400 acres northwest of Fort Lauderdale, Florida. Westinghouse views the development as an "urban laboratory."

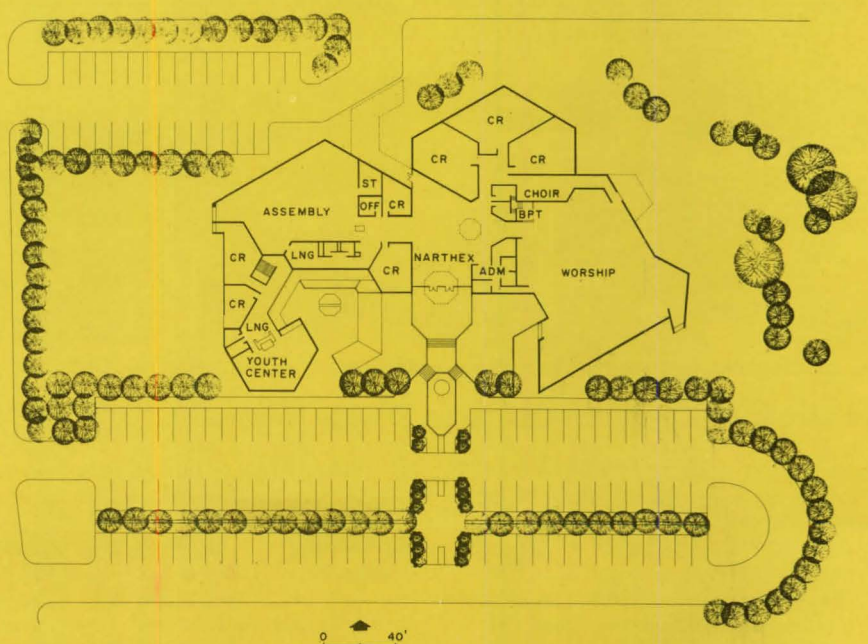
Baptists Hope to Compete With Corporations In Housing

The American Baptist Convention (ABC), through its subsidiary, American Baptist Management Corporation, is as thoroughly involved in real estate management, planning, architectural design, and construction management as any of the large industrial corporations, contractors, or package builders. But because it is a religious organization, ABC enjoys a major privilege — it pays no taxes.

The Baptists are the largest nonprofit, sectarian sponsors of housing for low-income families in the U.S. For the past two years, ABC has been building a corporate structure which, it claims, will enable it to compete satisfactorily and efficiently with other corporations in housing construction.

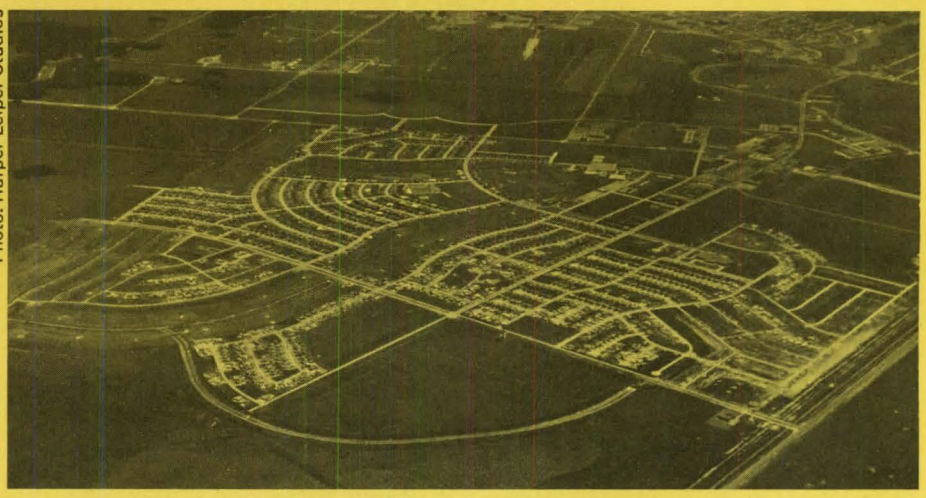
There are more than a dozen divisions in The American Baptist Convention, including The American Baptist Home Mission Society, with a Department of Architectural Services. Within this department are three subdivisions: Architectural Field Services, Architectural Research and Design, and Building Services.

The Baptists have already initiated, developed, and supported 32 educational institutions, 42 homes for the aged, 10 hospitals, and 11 children's homes. They have sponsored 1944 units valued at $29.7 million and report that 1250 units valued at $24 million were "feasible projects in process." Some examples of their current projects are: a $6 million East New York Model Cities program to provide 232 housing units and the rehabilitation of 24 row houses, a student housing complex in Mexico, apartment houses in the states of Washington and Wisconsin, and churches scattered throughout the country.



First Baptist Church in Piqua, Ohio designed by Laz & Edwards, architects, Champaign, Ill. The architectural department of ABMC served as program and design consultant.

Photo: Harper Leiper Studios



Humble Oil's Clear Lake City. NASA's Manned Spacecraft Center is in background.

Humble Builds City On Unproductive Gas Field

Outside Houston, Texas, where cattle once grazed amidst oil derricks, two new cities — Clear Lake and Bayport — were built by the Friendswood Development Company, a subsidiary of the Humble Oil and Refining Company.

With a combined population today of 50,000, and a future population estimated at 150,000, the twin-city project was begun in 1962 as Humble's first plunge into real estate.

Friendswood was formed by Humble after an investment group determined that 23,000 acres of an unproductive part of an oil and gas field owned by the corporation should be developed by the corporation as a new city. The first problem — to create a market for new homes — was overcome when NASA graciously accepted a gift of 1620 acres for its Manned Space Center. This land had been given by Humble to Rice University, which in turn passed it along to NASA. A market was thus created for new houses, and Friendswood formed a partnership with Del Webb Enterprises to develop, build, and manage the project. However, the Webb partnership did not work out, reportedly because residential designs were unsuitable, and Friendswood bought Webb's interest.

About 20 industrial companies now provide economic support for Bayport and Clear Lake. The majority of the new industries are dependent on fuel and petroleum products manufactured at the nearby Humble refinery. Thus, the new complex creates new markets for Humble products and a market for Humble's real estate developments.

More recently, Friendswood began another new town development by purchasing from the King Ranch, Inc. (which owns more than a million acres around the world and 800,000 acres near Houston alone) a one-half interest in 78 sq miles of wooded land 20 miles from Clear Lake City-Bayport. Friendswood acts as managing partner and developer for the new city called Kingwood. Although Kingwood is mainly a bedroom subdivision, Humble promises to build schools, churches, a commercial center, and roads.

Photos: Henry Schofield Studio





Two hospitals built and owned by HCA were designed by Howard, Nielsen, Lyne, Batey & O'Brien, Inc., engineers and architects.

Corporation Builds and Operates Private Hospitals

Most corporate involvement in building is in the housing market, but the Hospital Corporation of America (HCA) realized that profits can be made from another building type — hospitals.

HCA is a new organization under private ownership, operating from Nashville, Tennessee, which has acquired a number of existing hospitals, has two more under construction, and eight others planned. As part of their comprehensive operations plan, full architectural services are provided for all projects. These services include design, construction, equipment, and furnishing of new facilities or the remodeling and expansion of existing facilities.

HCA will buy or build clusters of hospitals, large and small, within a radius of 75 to 100 miles, so that the more elaborate facilities of the large member hospitals are made available to the small ones. Limited-service hospitals are planned for locations where a special demand exists. Not only are the resources of the group used to a greater extent, but the combination of institutions makes possible the purchasing of supplies in large quantities, pooling of information, centralization of computer programs, laundry facilities, and other large-scale services and operations. With this program, HCA can satisfy its investors and still offer financial advantages to the patient.

HCA's Board of Directors, headed by Jack C. Massey, chairman of Kentucky Fried Chicken, is responsible for the acquisition of hospitals, and for purchases, services, and other matters that affect the corporation as a whole. Each member hospital has a certain amount of autonomy through its own "management committee." The committee members must be HCA stockholders, and one member is a representative of the parent corporation. Apart from the Administrator, one of whose principal jobs is to represent the hospital in the community, the other committee members are physicians.

For downtown Oakland, Oceanic's architects designed a city center complex with offices, galleria, restaurants, hotel, department store, and shops.

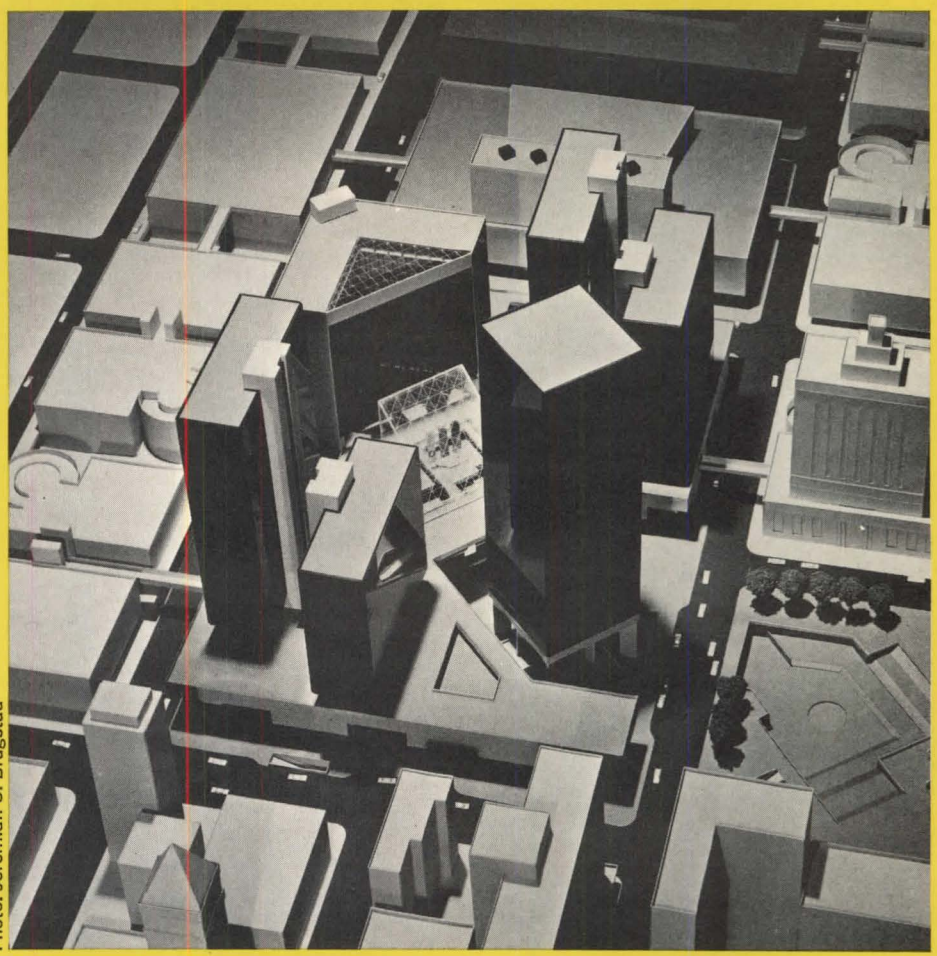


Photo: Jeremiah O. Bragstad

Sea Ranch Developer Spreads Into Urban Redevelopment

Castle & Cooke, Inc., grows and sells pineapples (Dole Pineapple), Bumble Bee seafoods, sugar, macadamia nuts, glass, steel, machinery, and pharmaceuticals, as well as houses, new towns, and real estate developments. Its land development subsidiary, Oceanic Properties Inc., builders of Sea Ranch (MAY 1966 P/A), is unique in the development business because it has access to Castle & Cooke's capital resources, which provide it with the staying power that long-term investments require.

Financial strength enables Oceanic to pursue a number of large projects at one time. Currently, the corporation is undertaking urban redevelopment projects in San Francisco, Oakland, Newton, and San Jose, as well as the construction of new towns in Oahu, Hawaii, and Hamilton, California. Sea Ranch was Oceanic's first venture into a conservation-oriented concept of land development, located along a 14-mile stretch of northern California coastline. "Because of its financial position, Oceanic is one of the few companies in the world which would undertake a development like the Sea Ranch," says Warren Haight, president of Oceanic Properties Inc., "Any new, precedent-setting undertaking by its very nature is a long-term investment."

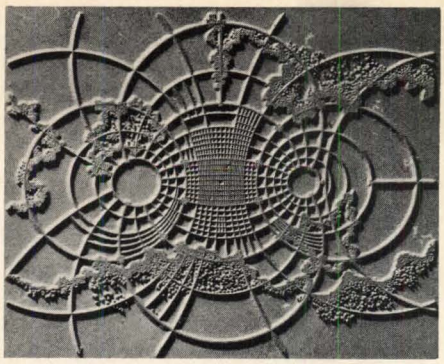
Castle & Cooke's capital resources also enables Oceanic to bring to real estate development the resources to integrate design and construction without compromising quality. Most developers are unwilling to invest the money for a complete in-house staff of designers, but Oceanic has a permanent staff of 12 landscape planners, architects, and urban planners. "The architects on my staff," says Haight, "are all anxious to become managers so they can get their hands on the throttle and be in on the planning from the very beginning." Oceanic is also making heavy use of computers and systems analysts for the cash flow problems that plague all developers; for the San Jose project, a complete economic model has been developed by these professionals.

A new spice has recently been added to Oceanic's mixture of pineapples and real estate with the acquisition of a Los Angeles-based home building firm, Barclay-Hollander-Curci Enterprises. "Money" for the acquisition was an issue of 425,000 shares of Castle & Cooke common stock and an agreement of additional issues depending on BHC's performance. (BHC is currently in the initial development stages of a 900-acre planned community in the Santa Monica Mountains near Los Angeles, as well as building houses in other southern California locations, all of which now accrues to Oceanic's expanding empire.)

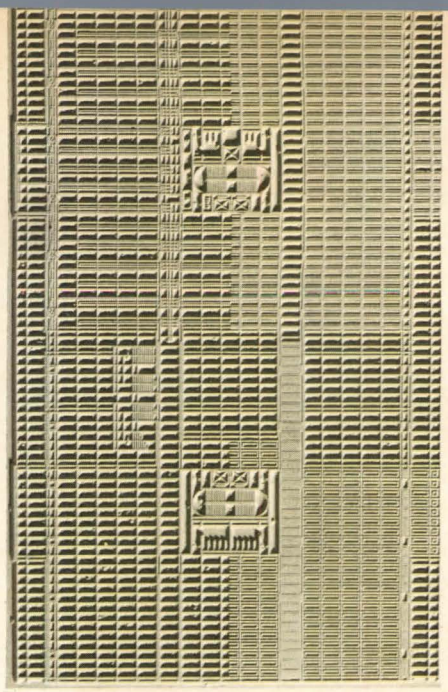
Oceanic and BHC together are part of the small but growing group of big volume builders whose ties with wealthy corporations are enabling them to expand their operations from home sites to new towns. Although small companies still dominate the housing and development businesses, the trend is running clearly in the other direction, and the emergence of a housing and development corporation of the size of GM is in the cards in the future.

1 The language of systems could be expressed in truly unusual poetry, for things are not simply what they initially appear to be, but what they could be if properly developed. Shown is an image of an open system, developed by coating a glass sheet with carbon black; oil has been used to distribute the carbon. The oil, continuously supplied in uninterrupted motion, has been subjected to gravity. (Study by Jekabs Zvilna.)





2 Structure of a City as a System: Proposed structural network for a new city, starting at the core with a simple orthoganal grid that grows outwardly, changing in geometry, dimensions, and use while preserving its unity and continuity. Topological transformations can take place without affecting the laws of organization, performance, and construction that regulate the life and the structure of the system. (Eduardo Catalano.)



3 Plan of Building Footprint, showing structural, mechanical, and electrical components. The footprint can expand or contract, change spans, modules, heights and volumes, add or remove components, type and location of vertical and horizontal circulatory systems. It achieves for each assembly a different environmental quality without affecting the working of the system. (David L. Pavelka, M.I.T., 1966.)

A CASE FOR SYSTEMS

By Eduardo Catalano, Professor of Architecture, Massachusetts Institute of Technology. Talk delivered at School of Architecture, University of Kentucky, November 1968.

Arnold Toynbee, in what he calls the third world war without genocide, says that the common underlying basis behind all the apparently multifarious revolts we see today is the effacement of the human personality produced by the advance of science and its application in technology. Depersonalization, symbolized by the computer, he says, is the outrage against which human beings are now revolting. "Is it possible for us, human beings, to reassert our personalities against 'Brave New World' without wrecking it? And, can we afford to wreck it? . . . If we wreck it, shall we not starve? Is it possible to arrive at any compromise?

"We cannot yet begin to see the answers to these questions," Toynbee continues, "but we can already see that the answers, whatever they may be, will be fateful for mankind's future."

I do not pretend to say that I see the answers to these questions; however, I have other questions that may help us to clarify the questions.

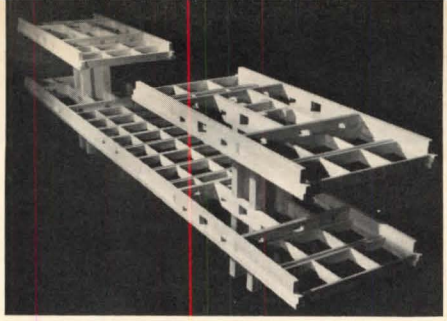
The reason underlying the revolts we see today is not the depersonalization of man but the frustration of realizing what man *could be* and seeing what he *is;* of realizing what he could accomplish and seeing how he fails, in spite of abundant physical and creative resources. The revolt is directed against the inertia of the insiders, those who have the power and the tools to shape a livable world but are unwilling or unable to do so.

Let us leave the complaint about the loss of personalization to the social critics while we architects dedicate ourselves to building a livable world, not by first wrecking it, or by compromising with the computer, but by mastering our new tools to develop an architecture of total participation.

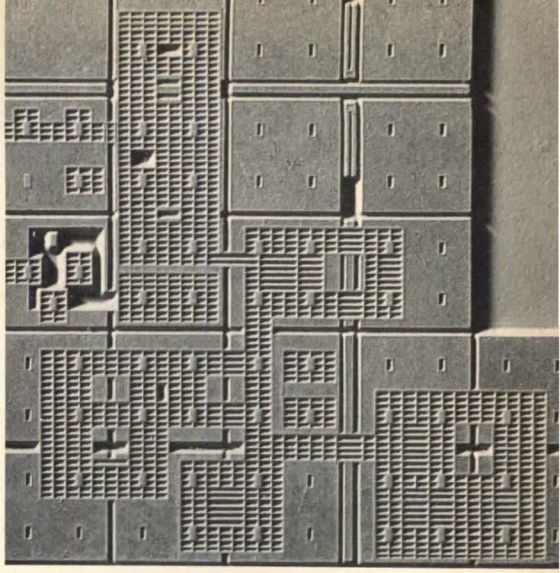
To develop such architecture you must start anew. Do not depend on my generation, because we never took a stand and seldom had the curiosity to seek new frontiers. On the contrary, we took shelter under the banner of individualism, not to protect us against our depersonalization, but to hide our own scientific and technological ignorance.

We cannot ignore what has happened in this country in recent years as a result of the explosion of accumulated frustrations. One man alone challenged the power and policies of the highest office of the country; students, uninspired by the old politics, joined their efforts in search of an *alternative* to our political process. Rejecting the social, political and economic status-quo, they demonstrated the power of their unity and imagination.

But what occurred in the politics of the past is also happening in the architecture of the present. That is — nothing. The status-quo in both fields, politics and architecture, has always been disguised by new slogans; however, the approaches remain the same. Like politics, architecture has not changed in its being, but only its face through the use of new visual slogans. Buildings of the last decades, considered outstanding examples of architecture by critics, are, conceptually speaking, merely archeological resurrections disguised by short-lived visual slogans.



4 Industrialized prestressed modular concrete structure for building footprint. (Weldon Pries, M.I.T., 1966.)



5 How can we expand these flexible building footprints, so that they become continuous components of the fabric of our large and changeable urban complexes? (Eduardo Catalano.)

Status-quo architecture, always moving but not advancing, can be characterized by its social indifference and its individualism in conception, performance and construction, the latter through its custom-made "anti-processes." I wish that architectural students would reject the ill-inspired individualisms that affect our present-day designs and dedicate themselves to a new start of collective aspirations.

They should reject all prejudices about individual human behavior and responses, poetry, subjectivism, depersonalization, and start anew on all levels, from the fundamentals of sociology to the removal of a screw, an indispensable object in our technological inventory. Lévi-Strauss believes that there must be a *ground plan* that expresses and satisfies our human behavior and needs. To search for the *constants* of such *ground plans* upon which to base our architectural systems is, for us, as architects, a necessary condition, not only to recover our personalization, but also to enrich it to meet the responsibilities of our time.

I wish for the students' rejection of *escapist* architecture, which is confined to visual changes ill-inspired by the "avant garde." They should realize that lasting visual values cannot be conceived, but come as the result of all the forces that define the working of a system.

I wish that architectural students would begin to seek an architectural alternative to status-quo architecture with the unity of purpose and fruitful imagination and courage they showed in attempting to change the political process. They should see in architecture the faults they have found in politics, for both worlds are one and the same. The evidence of our failure as governments or as builders is the same; we have only to look at the ghettos to see it. Politics and architecture, with their common status-quo positions, are destroying each other. Many are revolting against this, but we are not. Even the pillars of the Catholic Church are being shaken by young priests: "The Catholic layman," said one, "lives in a world of jets and atomic bombs and prays in a world of medieval magic."

Architecture and Social Reality

What surprises me most is that recent awareness of the old ghettos has created in our youth a strong reaction against local governments, politicians, and landlords, but not against other forces in positions of social responsibility, such as architects and architectural education. On the contrary, a paradox exists. While students of architecture have a deep concern over present social injustices, decaying cities, the misery of slum life, and especially the lack of decent shelters for housing, health, education, and work, they have concurrently revived the cult of individualism, which is in marked conflict with the social and technological problems they aim to solve. Such an attitude increases the confusion in which we live, for we cannot aspire to work as individuals, producing individual solutions to satisfy individual whims and needs through custom-made construction, and at the same time pretend to be part of a generation that is searching for an architectural alternative of social and technological dimensions.

Because of our past neglect in providing satisfactory shelters, and because of the population explosion, we face today a new scale; we face a problem of numbers. Our collective needs are too great in quantity and size to attempt to satisfy them through small "museum pieces." The art gallery of yesterday has been replaced today by the entire city. The new problems are too complex for us to pretend to contribute to their solution through isolated individual efforts, infested with personal mannerisms and romantic techniques.

Architects and architectural schools have been very negligent, to say the least, in their concern for our problem of numbers. For many years, we have hidden or ignored our social reality. This gave us the impression that architecture was still responding to the needs of society as a collective body. Under such a complacent assumption, we, in the architectural schools, neglected our responsibility to awaken a social conscience and to search for the development of radical ideas in planning and building technology.

In these last years, because of riots in the slums, the exposure of poverty, the inspiration of a very few political leaders and the rebellion of students, everyone is suddenly becoming aware of our national priorities. The war in Vietnam will have to end; our strong economic and industrial resources will have to be diverted to a massive program of construction to build 10 million dwellings a year, while one-third of almost every city urgently requires total renewal. Everyone is also fully aware that this problem is not temporary and that the rate of population growth has made urban growth and change a permanent problem of ever-increasing scale and complexity.

Architect the Unready

At this point, we have to ask ourselves: Are we architects ready to meet the challenge? We are not.

For we know that if today all the economic and industrial resources were put in our hands, if planners and urban designers were to provide us with satisfactory guidance or a structure upon which to build or rebuild our communities, we architects do not have at our disposal the design and technological tools to meet the challenge. What we have is a rudimentary design vocabulary and an obsolete technology that is disguised by a few new cranes on the skyline parading as a show of new ideas in building construction.

If we, the architects, are not prepared, then are our architectural schools in process toward meeting the challenge? I say no again. Schools of architecture, wandering in the open field, and under the false pretense of broadness and variety, offer *random approaches* to design that lead to individual, non-purpose, "status-quo" architecture.

We should reject random approaches to design, for architecture can no longer follow the fugitive, random, and cyclic changes of art, moving without advancing. Instead, we should coordinate the cross-fertilization of ideas and approaches, toward a *common purpose* architecture of community and industrial participation.

Status-quo architecture, with its social indifference, is ill-inspired individualism, and its piecemeal research and development, will never be able to close the gap exposed by the revelation of our national priorities. On the contrary, the gap increases as time passes.

Lost Chances

My generation has failed to meet the challenge. You have to recognize the problem and formulate the basis of an

A CASE FOR SYSTEMS

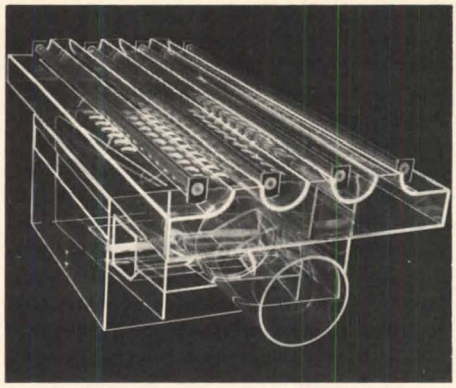
architectural alternative to our present status quo.

In 1850, we lost the last of several opportunities to consolidate an architectural alternative. The new voice of Joseph Paxton, with his systematized, industrialized, demountable, and flexible modular structures of greenhouses, pavilions, and the Crystal Palace was silenced by a reactionary architecture of neo-Gothic inspiration. It was the architect of the London Parliament who once told Paxton to confine his work to his greenhouses and leave architecture to the "experts." The architecture of Joseph Paxton was not only a technological breakthrough; it was a lesson in the creation of an environment. It was the first and last example showing that pure poetry can also be achieved through the development of *architectural systems.*

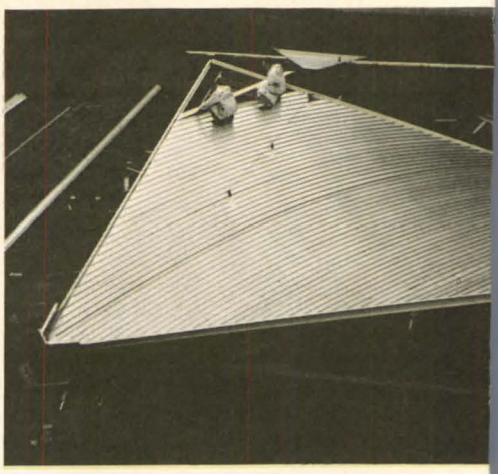
Searching further back, in the 14th Century, the magnificent spatial and technological developments of Chartres and Beauvais were ignored in the work of Renaissance architects, who by their revival of Roman techniques, interrupted the historical evolutionary process of construction. Ever since (except for Paxton's work) architecture has been deprived of the continuity in research and development so necessary for growth and evolution away from the ills of individualism.

Archibad MacLeish, commenting recently on the vitality of today's social poetry, said, "The heart is a social organ, not a private one." It seems to me that, when poets reflect a deep social involvement in their work, it is also time for architects to reject their purposeless individualistic attitudes and address themselves to discovering the *new poetry* that can be created through an *architecture of truly collective participation.* For their voice is meaningless without a social echo. The strength and success of our *architectural alternative* may depend on this discovery.

Many architects, by emphasizing individual solutions to satisfy individual needs and whims through custom-made construction, seem to believe that a livable world cannot be created through an architecture based on systematized design and industrialized construction. They philosophically reject systems before understanding what they are and what they could be. Because it is difficult to discover, along with the process of synthesis, the laws of behavior, organization, and construction that regulate the structure and life of a system, it is much easier to design random forms that change with the mood of the day than to develop systems within the discipline imposed by science and technology. Even poetry, our last sanctuary of freedom, has its own laws of organization and performance. Hidden, within the freedom of its form, there are clear structural systems where the persistency and universalization of ideas, the symmetry of sounds, the changes of words and vowels are essential elements in the creation of the poetic drama. Systems in poetry today constitute an important part of advanced studies in the field of linguistics.



6 We should abolish forever the absurd divorce of understanding, knowledge, and activities between building designers and designers of building products — example: Modular Air-Lighting System. Plexiglass prototype model of duct and induced air box unit combined with fluorescent light fixture to be installed exposed within structural coffers. (C. Long; W. Burch; R. Bailey; J. Scott; J. Sheehy, M.I.T., 1967.)



7 Perhaps the universities, in their new social role, can act as an inspirational force first, and as a coordinating one second, to reorient the entire building industry toward a philosophy of systems. How long can we, as architects, depend deeply on an industry with which we do not collaborate? Prototype Extruded Aluminum Shell. (Reynolds Metal Company and Eduardo Catalano, M.I.T., 1959.)

Life-Change-Systems

The essence of a system is *life* and its capability to change, to adapt itself to new demands. Architectural systems are not based on sterile patterns, but on cohesive design ideas that provide ever-changing organization of spaces and building components. When well conceived, their new language could be expressed in truly unusual poetry, for things are not merely what they initially appear to be, but what they could be if properly developed.

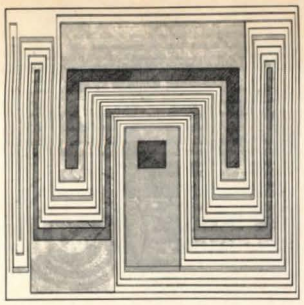
There are several misleading beliefs that still handicap the acceptance and development of systems. One is the belief that determinism in systems imposes restrictions on our imagination. Imagination, however, is no one's monopoly, and cannot survive the lack of two essential characteristics of systems: purpose and discipline.

Part of the same prejudice is the belief that all systems are based on fixed laws of spatial organization and construction that lead to standard solutions, visual boredom, urban sterility, and death of the spirit and individual freedom. On the other hand, it is believed that "anti-system" architecture, being as free as art, brings a wealth of conflicting ideas, each one challenging the others, each one evolving from another. However, building systems can provide unlimited topological transformations, as rich as our imagination, by the changes in their components in lengths, sections, sizes and angles, in their relative position to elements of reference, in their continuity as positive or negative surfaces, open or closed, or as lattices, whether straight or otherwise, totally or partially expanding or contracting. Their three-dimensional variety can express further dimensions through the physical and subjective qualities of materials of construction, and through the unlimited formal freedom of shaping the earth and the landscape.

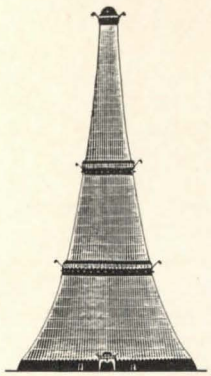
The other belief is that status-quo architecture, with its individualistic orientation, can cope with our present and future needs if the country's economic and industrial resources were put at the service of social forces instead of being at the service of the anti-social ones of the military-industrial complex.

Inadequate Present Means

According to our present criteria of building obsolescence, 90 per cent of all the buildings in this country will have to be replaced by the end of this century. To



8 There is a misleading belief that determinism in systems imposes restrictions on our imaginations. Topological solution to a problem of common boundary between three areas, following predetermined conditions of distances and time.



9 Proposed systematized and industrialized building in enamel, steel, and glass, designed in 1887, as an English answer to the Eiffel Tower.



10 Membrane Structure. (Horacio Caminos, University of North Carolina, 1960.)

this, we should add every architectural need to satisfy our population growth estimated at 50,000,000 people for the year 2000. However, with our present design and construction methods and industrial rate of growth, we will be able to satisfy only 30 per cent of our projected needs. Let us also remember that any proposed new process requires at least a decade for development, after which more decades are necessary for it to make its presence felt.

Some years ago, I gave a talk at the University of Minnesota where I presented, among others, the following questions:

- Why have we developed so many custom-made designs as though the sum of their individual solutions could provide a general answer to our enormous collective needs?
- Why is every building that is designed different from every building previously designed?
- Why do we always start from *zero* in our design process? Why do we not establish continuity in our work so that we may develop a method of work and achieve an accumulation of experience upon which true research and development can be based?
- Are we aware that our search for self-expression and individualism, our change of mood and lack of consistency, our emphasis on the ancedote and our lack of social responsibility prevents the development of systematized design and construction to reorient our building industry and to bring us closer to an architectural and social breakthrough?
- Have we made any attempt to analyze the broad spectrum of life and our collective needs, to formulate the few *building constants* from which our systematized design and construction must evolve?
- Since our present-day buildings become obsolete before they are finished, how can we organize architectural systems based on flexible modular structures and mechanical components — as basic functional skeletons, as building "footprints" — from which it is possible to create a rich variety of environments within which changeable needs of life can be satisfied?

In other words, is it possible, using the same building "footprint," to change modules, sizes, spaces, to vary the type and location of vertical and horizontal circulatory systems, to add or remove components, to expand or contract, to change heights and volumes and to achieve for each assembly a totally different environmental quality, without affecting the basic laws of organization, behavior and construction that regulate the working components of the system?

- How can we expand these flexible building footprints so that they become continuous components of the fabric of our large and changeable urban complexes?
- Why can we not direct our efforts in such a way as to put architecture on the same basis of research and development that exists in other scientific and technological endeavors?
- How long can we, as architects, depend deeply on an industry with which we do not collaborate?

The architect is not a sculptor but a designer and builder of systems. The longer we delay in freeing architecture from slavishly following the random curve of art, which moves without advancing, the sooner will business and industry, lacking social understanding and design education, dominate without hindrance the urban scene with generally ill-conceived industralized constructions.

To Begin — Begin

What I am saying is not new. However, the belief in systems has not yet effectively reached political, economic, educational, professional, and industrial groups for us to see a new start. Architects and educators naively believe that well-intended efforts by a few individuals can lead to the development of architectural systems. It will take many years of study, many thousands of people with diversified backgrounds but common purpose, and the disinterested but involved participation of the building industry to set the basis for this never-ending process of systems. No serious beginning can take place without our participation in the reorientation of the building industry. For what industry is doing today is to manufacture building components without an understanding of the architectural processes that regulate the design *and need* of those components and the buildings they go into. As a result, we possess the largest stockpile of random building products ever produced, which, amazingly enough, architects manage to use in their obsolete, unimaginative designs and corrupted constructions.

No serious beginning in changing the architectural process can take place without the participation of universities. In a time of critical priorities, schools of architecture, enjoying the same "sanctuary" that protects the fields of humanities, are apparently ignoring man to protect him. By borrowing the "eternal present" that characterizes the humanities, architecture pretends to live in the realm of *art* and aspires to survive obsolescence by minimizing the importance of its social and technological roots. Perhaps the universities, in their new social role, can act as an inspirational force first and as a coordinating one second, to reorient the entire building industry toward a philosophy of systems.

Such a philosophy is necessary to prepare a new grammar in building construction, to simplify concepts, to inte-

A CASE FOR SYSTEMS

grate ideas, and, most important, to abolish forever the absurd divorce of understanding, knowledge, and activities between building designers and designers of building products. We can no longer conceive of an architecture that depends on the disorder of our industrial production and the obsolescence of most of the laws or anti-laws controlling our designs.

A serious beginning will take place when universities inspire in their graduate students enough motivation to join the laboratories and workshops of industry in masses. This will take place when designers realize the tremendous power we have in our hands. Wherever we move, we are surrounded by *self*-produced objects. Everything we make is obsolete in thought and needs to be changed by radical concepts in design: new concepts to recover air and light, new concepts for collective living, new concepts of environmental control, in the development and use of energy, in private and public transportation systems; new concepts to "free" our buildings from gravitational forces; to remove the asphalt forever and let the earth breathe again.

If the energy we have accumulated for destructive purposes were released for peaceful designs, we would be able to change the shape of the earth.

There may be many more barriers to overcome. New legislation for land use, for financing, for new building codes, as well as for labor participation, is necessary for the realization of this architectural breakthrough. A few months ago a report presented by a national labor organization accused architects of being mainly responsible for the delay in accepting advanced construction techniques. However, it is known that the unions very often handicap the development of new methods of construction, for fear of unemployment or because of egotistic struggles among themselves for jurisdiction over the type of task to be performed by their members.

The New Scale

There is a *new scale* in the urgency, importance, and complexity of our tasks toward which we should direct a new scale in our efforts and resources. The new scale is seen in Federal Government participation in financing large projects, in getting legislation, in expropriating vast areas of land, in taking over blighted districts of cities. The *new scale* begins to be seen in the newly formed state-free enterprise coalitions. In New York alone, a corporation with power *over the powers of the cities* was recently formed with authority to spend $6 billion for rebuilding the decaying cities of the state, to get legislation, to change building standards, and to obtain land.

The *new scale* is seen in the size of the projects. The city block is no longer large enough to contain the single building; buildings are being conceived as continuous structures freely spanning networks of streets. With the *new scale* for buildings and transportation systems, the streets themselves will soon loose their present meaning. Even in the specific areas of construction, such *new scale* requires the use of large-span structures, which demands the development of new materials and new technology to preserve our designs within the laws of economy.

The *new scale* does not necessarily mean the surrender to the so-called "big brother"; it means the realization that only massive, comprehensive solutions can be the answer to today's problems of numbers.

In recognizing the *new scale*, leading universities should combine their creative, financial, and physical resources to achieve a new scale in their voice, and propose to the government an inter-university-industry program for the development of urban and building systems.

For such inter-university- industrial programs to succeed, it will be necessary:

(1) To avoid the moral dichotomy of simultaneously offering obsolescence in architectural design and advanced education in other branches of knowledge that exists today in our universities.

(2) To revise the research policies of the universities, which impose heavy economic burdens on academically desirable projects, even if they are sponsored by nonprofit organizations of high social aims.

(3) To approach research, teaching, and learning as an indivisible educational activity.

(4) To receive assistance from the fields of general studies, economics, social and political sciences, management, law, general history and history of art, of architecture and of science and technology to develop a spirit of *forma mentis* under which our changes can take place.

For example, we should rely more on history to guide us through its understanding of the past and present. However, the relevancy of its findings is mostly limited to past events. If such is the sole role of history, we should then offer new courses on the evolution of cities and urban life, science and technology, beyond the present, and their influence on the man of tomorrow. The time is long past when scholars should have expanded their frontiers of studies into the world of the future.

(5) To offer new technical courses on manufacturing processes, without which we will never be able to assist the building industry from within.

(6) To develop a general grammar for systematized design and industrialized construction common to all architectural needs by rejecting the present classification of our buildings into building types.

It would be an error to believe that we can change the architectural process by designing advanced industrialized building types. We will not change our process until it is affected more deeply by:

- Unification of measurement system.
- Revision of building codes and transportation of components regulations.
- New relations and responsibilities between management and labor.
- Partnerships between architects and industry to program and design the new systematized components.
- Developing multipurpose new materials where the seemingly impossible integration of their structural, acoustical, thermal and other physical properties is achieved. There are no courses offered on materials that go beyond the very general description of their physical properties. Such courses provide only cataloging information, and avoid participation in new developments within the industrial process.
- Redesigning machines and tools to find economical methods to assemble as well as erect materials.
- Reevaluating the joinery of materials through chemical or mechanical discoveries or inventions.
- New thermodynamic and electric discoveries to maximize efficiency and minimize the awkwardness of the present mechanical and electrical systems.

(7) To avoid becoming research agencies for the government, or satellite workshops of industry. Freedom from pressure groups is *the* essential condition for the productive survival of universities.

(8) Get parallel study groups in the inter-university-industrial program to challenge the fundamental steps to be initially taken, and to enrich the *common purpose* program with diversified approaches on systems developments.

I am convinced that if all this ever happens, the architectural profession will never be the same; it will expand into untried fields, fields of discovery and encounter, rediscovery and reencounter; it will feel again the presence of nature, whether controlled or in its wilderness. The land, now left scorched by the debris of our masonry and asphalt, will be recovered through solutions that will evolve from our urban and building systems.

This could well represent the greatest paradoxical lesson in history: As a paradox, it will show that science and technology, contrary to the beliefs of their detractors, can advance us to a truly livable world. As a lesson, it will show that man has unlimited capabilities for survival who, when properly inspired, always finds imaginative solutions to new problems. It takes the efforts of a full generation to bring about a change. If a stand is taken *now*, working for an architectural alternative of full reevaluation and of full participation, the genocide that may come "*without world wars*" may be avoided!



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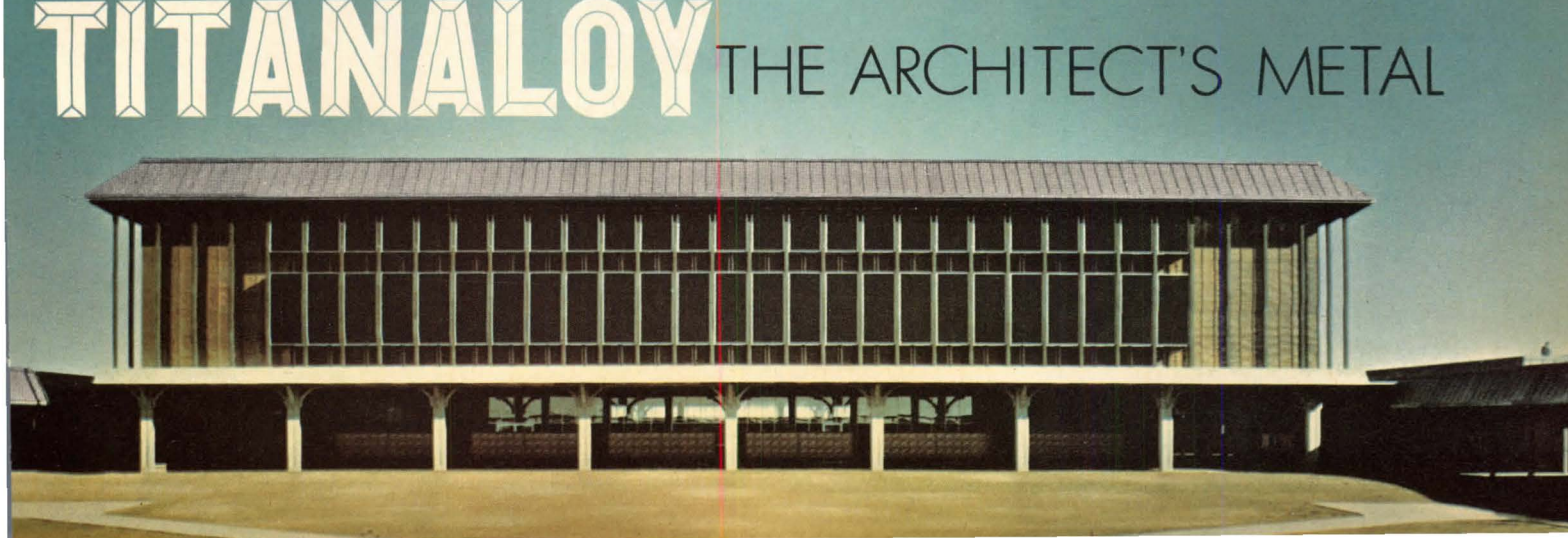
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SPECIFICATIONS CLINIC

EXPANSIVE CEMENT

BY HAROLD J. ROSEN

An expansive component of cement eliminates shrinkage cracks in concrete and thus reduces maintenance, and can be used without a waterproofing membrane. Rosen is Chief Specifications Writer for Skidmore, Owings & Merrill, New York City.

A few years ago, scientists made a major technological breakthrough in the chemistry of cement with the development of an expansive component, anhydrous calcium sulfoaluminate. This enabled expansive cements to be formulated by intergrinding regular portland cement and the expansive component. The purpose of the product is to compensate for the drying shrinkage of concrete.

Although there have been many attempts over the past years to develop an expansive cement commercially, none were successful until the Chemically Prestressed Concrete Corporation produced Chem-Comp. To date, five major U.S. cement manufacturers have been licensed to make this cement.

Since its introduction, expansive cement has proven to be of significant value in concrete structures for the following reasons:

- It significantly reduces the shrinkage cracks found in regular portland cement concrete.
- It permits the use of fewer construction joints.
- It eliminates the use of sawed joints for crack control.
- It averts the need for special waterproof membranes and built-up roofing in garage structures, tunnels, and malls.
- It produces a concrete structure with greater dimensional stability.
- It reduces long-term maintenance costs.
- It permits greater freedom in architectural and structural design of reinforced concrete.

When the expansion and subsequent drying shrinkage of the concrete takes place against some restraint — either internally against the reinforcing steel, or externally against rigid forms — the slight expansion of the concrete works against the restraint to put the steel into mild tension, and the concrete into slight compression. The subsequent drying shrinkage relieves some of the forces in both the restraining medium and the concrete. Since the concrete is always under slight compression, it does not go into tension. In contrast to what usually occurs in portland cement concrete, shrinkage cracking is prevented during drying.

Despite tight specifications that spell out needs for such items as proper design, good workmanship and curing, shrinkage cracks are a fact of life in regular concrete. Expansive cement will virtually eliminate this objectionable characteristic in slabs, paving, and structures.

In normal concrete slab construction, checkerboard patterns for placing 2500-sq-ft areas are commonplace, requiring many construction joints. With expansive cement, areas can be increased to 15,000 or 20,000 sq ft, thereby reducing the number of joints and the need for checkerboard placement. Economies result from the elimination of construction joints and permitting continuous pours instead of sequential placement during construction.

In floors of large industrial plants, sawed joints are normally cut on 20-ft to 25-ft centers to control shrinkage cracks between expansion joints. Expansive cement eliminates the need for sawed joints to control shrinkage cracks, the accompanying joint sealants, and calking and maintenance.

Garages usually have been designed with waterproofing membranes beneath slabs to reduce water damage to automobiles and the structure below. Because expansive cement concrete avoids most shrinkage cracks, slabs have been successfully designed without membrane waterproof coverings. Roofs of these structures have also been planned without built-up roofing over the expansive cement concrete.

Both original and long-term maintenance costs can be appreciably reduced through the use of expansive cement concrete floors. This is of utmost importance for concrete floors in hospitals, food processing and beverage plants where deleterious materials work their way into shrinkage cracks, which develop in normal concrete with serious consequences to the floors. The resultant accumulation of foreign materials in these cracks also poses health hazards. Calked joints in slabs always require frequent, costly replacement and repair work.

Since the architect has, in effect, a new material to work with, he can project paving for plazas and other large surfaces with a minimum number of joints. His design efforts are no longer hampered by the limitations of normal concrete practice. There are currently several new projects being constructed based on design of structures with large panel sizes and pours that take advantage of the elimination of close and frequent joint spacings.

Other possibilities for expansive cement include prestressed elements, tilt-up walls, mortars, grout, and gunite as a replacement for regular portland cement. Improved concrete will result from its use if proper restraint is used.

Although proper concrete practices are sufficient to produce good results with expansive cement, designers seeking to use it for the first time should seek technical assistance.

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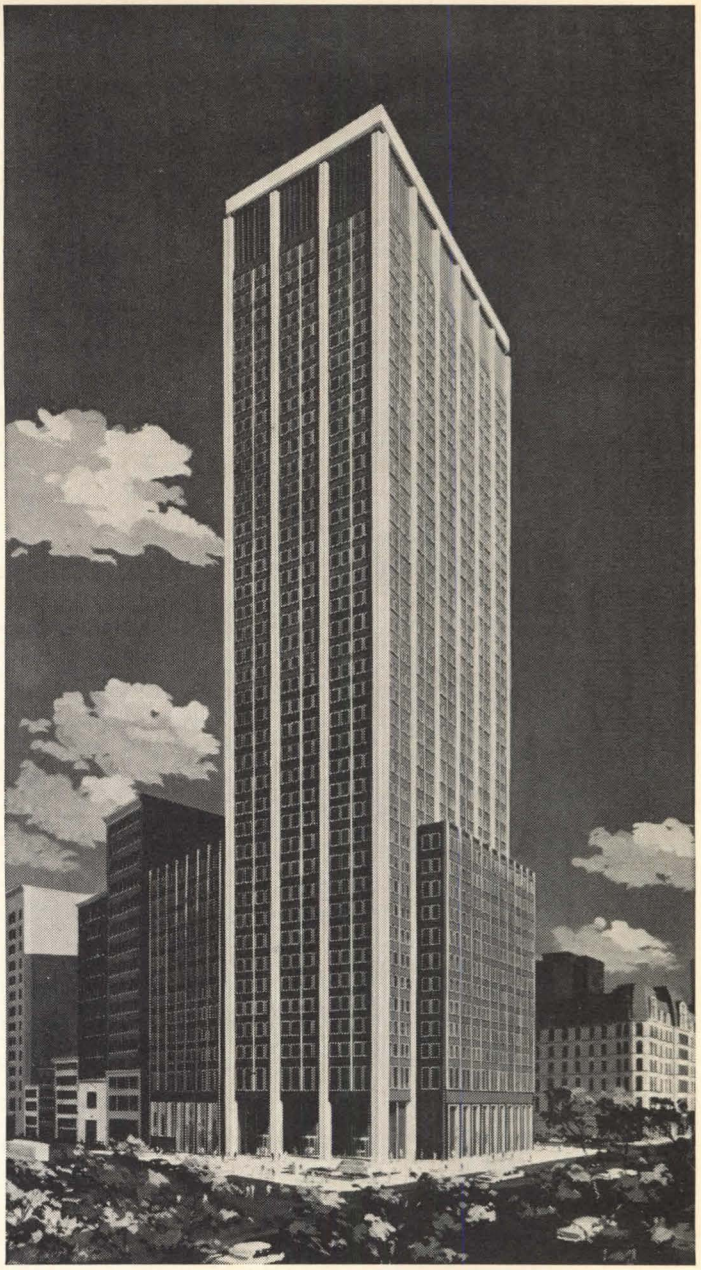
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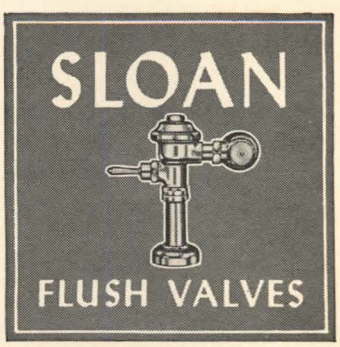


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IT'S THE LAW

ARCHITECT-ENGINEER CONTRACTS

BY BERNARD TOMSON AND NORMAN COPLAN

P/A's legal team discusses possible ways of changing existing architect-engineer form documents to better protect the architect.

Some architects feel that the relationship between architect and consulting engineer requires clearer and perhaps different definition than that provided by existing contractual form documents. When an architect retains a structural, mechanical, or electrical engineer, the traditional view is that the consultant renders services as agent for the architect, and the architect is expected to have that degree of knowledge and competence to enable him to review and approve the consultant's work. The architect is charged with responsibility for the engineer's performance and is subject to liability for any errors or omissions committed by the consultant. Furthermore, the architect is obligated to pay the consultant's fees whether or not the architect has been paid by the client; the contract between architect and engineer is basically independent of and separate from the contract between architect and owner. However, the traditional view of how the architect and engineer should work together to produce the services for a project sometimes bears little relationship to actual practice.

By contracting with the owner for the furnishing of all architectural and engineering services, and in turn retaining a consulting engineer to actually render engineering services, the architect maintains control and leadership of the project. With leadership and control, however, comes responsibility and liability. Many architectural offices rely exclusively on outside engineering consultants for the furnishing of structural, mechanical, electrical, and other engineering services. This reliance is in some instances complete, and the so-called verification or approval of engineer's drawings and specifications by the architect is actually fictional. Although the legal relationship between architect and engineer in those instances may be one of principal and agent, their interaction, realistically speaking, is more closely akin to joint ventures.

The standard form of agreement between architect and engineer issued by the AIA reflects the traditional view of the relationship between architects and consulting engineer in its legal and practical application. Under it, the engineer renders his services to the architect, and the architect must approve the services. The architect is required to make payment of the engineer's fees, reimbursements, and "extras" pursuant to a schedule of payment contained therein. Should a dispute between architect and engineer occur, the form contract provides for arbitration. Except in cases where the agreement provides that the standards of the engineer's performance shall be measured by the prime contract between architect and owner, there is no subordination or tying in of the architect and engineer agreement to the owner-architect agreement.

As a result of this lack of any direct relationship between owner and consulting engineer, the architect may be in the dangerous position of being trapped in the middle between actions of his client and his obligations to the consulting engineer. For example, under such contractual arrangement, the architect is required to pay his engineer fees and other payments, whether or not the architect has received fees to which he may be entitled under his contract with the owner. If the owner makes a decision relating to the engineer's work that is binding on the architect under the owner-architect agreement, or which is of such nature that the architect feels he cannot or should not challenge it, the architect is not in a position under the contract with the engineer to compel the engineer to accept that decision. If there is a dispute between owner and architect that is submitted to arbitration, the result may be different than the result of arbitration between architect and engineer involving the same subject matter. If an architect must revise drawings to reduce costs without additional compensation, it does not necessarily follow that, under his contract with the engineer, he can require the engineer to revise his drawings under the same terms and conditions.

The contract between architect and consulting engineer can protect the architect in many areas from this "in-between" status by provisions that more directly tie in the engineer's rights, obligations, and remedies under his contract with the architect with the rights, obligations, and remedies of the architect under his contract with the owner. The most significant contractual arrangement in this context would be one that provided in substance that the engineer would be paid his fees by the architect, if and when the architect is paid by the owner for the services performed by the engineer. Another provision might be that decisions of the owner that are binding on the architect shall also be binding on the engineer insofar as they affect the engineer's work.

What troubles architects most, however, is the potential liability they may sustain due to errors and omissions of the consulting engineer. If the traditional contract were modified to exclude this area of liability, it would inevitably mean a diminution of the architect's status and his role as the leader and coordinator of the project. The architectural profession can ill afford such a reduction in its status and prestige. The best answer to this concern about potential liability is not through a change in the traditional relationship between owner, architect, and consulting engineer, but rather through built-in protection of the architect to be included in his agreement with the consulting engineer. Such protection would include contractual clauses that provide appropriate indemnification of the architect by the engineer and that further require the engineer to carry adequate professional liability insurance. Although such provisions do not exclude all possibility of exposure, whatever risk remains would appear to be the price the architect must assume in order to maintain and extend his leadership role, which is so vital to the health of the profession.

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ONE OF HISTORY'S WONDERS

BY STANLEY ABERCROMBIE

THOMAS JEFFERSON, ARCHITECT. *By Fiske Kimball. DaCapo Press, 227 W. 17th Street, New York, N.Y., 1968. 205 pp., illust., $80. The reviewer is a senior designer with John Carl Warnecke & Associates, and is a registered architect in New York State.*

"Architecture is my delight," our third President said, "and putting up, and pulling down, one of my favorite amusements." Thomas Jefferson's putting up and pulling down did more than amuse: He was an architect of the first quality, producing at least one genuine masterpiece, and, because his architectural drawings were more explicit than any that had preceded them in this country, he can be said to be our first architect in the modern sense. But, possibly because the classic style of which he was both an innovator and an ardent proponent was later replaced in fashion by the Gothic Revival, and certainly because his architectural career was overshadowed by his political one, his buildings have been less publicized than they deserve.

Fiske Kimball's *Thomas Jefferson, Architect*, recently reissued in a new edition by DaCapo Press, has been considered an authoritative work on Jefferson's architecture, and its scholarship was important in establishing the reputation of the author, later Director of the Philadelphia Museum of Art. The book was first published in 1916, in a privately distributed edition of only 350, and it is indicative of the undeserved neglect of Jefferson's architecture that the book has had to wait over 50 years to be reissued.

The present edition is so physically beautiful that we turn the pages with awe (a feeling partly inspired, we confess, by the book's price). The heart of the book is a group of 233 drawings from the Thomas Jefferson Coolidge, Jr., Collection, given by Jefferson's descendants to the Massachusetts Historical Society. It includes James Hoban's original design for the White House and drawings by Robert Mills and Benjamin Latrobe, but almost all the drawings are by Jefferson himself. They are reproduced here, from new photographs of the originals, in the same generous size as in the 1916 edition. In addition to a general text, Kimball provides specific commentary on each drawing, a list of known drawings by Jefferson in other collections, an analysis of media and papers used in the drawings, and a list of the books on architecture Jefferson owned. There is also a new introduction by Frederick D. Nichols outlining some of the information about Jefferson's work that has been found since 1916.

Half the drawings in the book are for Monticello, which served Jefferson not only as home but as a working laboratory for his changing ideas. Here, more than anywhere else, he was continually "putting up and pulling down," and the Coolidge drawings are a record of the changes over a period of 40 years. Possibly because of the great number of changes, Monticello lacks the unity that would make it one of Jefferson's best buildings, but it tells us much about his architectural thinking. Many of his drawings, the later ones particularly, are very clear and precise, some drawn over a grid of ruled lines, and one of the earliest, from 1796, specifies a column diameter, based on Palladian proportions, of 1.4285 ft. More interesting to us, however, than the exactness of the ways in which he followed Palladio, are the surprising ways in which Jefferson was original. Monticello lacks the clarity and undisturbed symmetry of its model, Palladio's Villa Rotonda, but these qualities have not been sacrificed without cause. Instead of the undifferentiated rooms of Palladio and of most of Jefferson's contemporaries, the rooms at Monticello have designated uses, relate in appropriate ways to the novel circulation system, and are located with appropriate orientations to the sun. Even the idea of locating a plantation house on a hilltop, relatively inaccessible from the fields and waterways that supported it, was a novelty in its time, but provided, in addition to views of the Blue Ridge, an opportunity for a brilliant solution to the problem of servicing such a house: a vertical separation of service functions from the family living spaces. One drawing shows the disposition of these service functions — brewing room, smoke room, dairy, laundry, kitchen, pantry, meat room, summer dairy, servants' hall, stalls for 20 horses, the corn room, saddle room, buttery, beer cellar, rum cellar, wine room — all located, again, with concern for proper orientation, all connected under cover with each other and with the main house, all with their own light, air, and views. Yet the family and guests on the level above looked over this elaborate network and saw only gardens and the mountains beyond.

Other of Jefferson's residences represented in the Coolidge collection are Barboursville, Edgehill, Farmington, Ampthill, and Jefferson's own retreat, Poplar Forest. We also find here a 1779 study for remodeling the Colonial Governor's Palace at Williamsburg, the first proposed adaptation of the temple form for residential use and an idea that came to fruition later in Jefferson's "epochal" use of the Maison Carrée as a model for the Virginia Capitol was this country's first building of the classical revival and a building, of course, of tremendous influence. As Kimball wrote a year before the present book, in a doctoral dissertation devoted to this building alone, "At his first opportunity to design a monumental building, [Jefferson] broke with his earlier Palladian tendencies in a way which proved decisive for American architecture."

Unfortunately slighted in the Coolidge collection of drawings, and therefore in Kimball's book, is Jefferson's masterwork, the University of Virginia. It is represented by half a dozen plates, however, and a fold-out plan of the entire original campus has been added to this edition. Here, at the end of his career, Jefferson was at his most assured. The University impresses us at first visit with its astonishing grace and lack of pomposity. There is nothing forced or pretentious here. Looking beyond its evident beauty, we find a remarkable plan: parallel rows of student apartments linked by continuous galleries face each other across a generous central lawn, each row punctuated by pavilions containing professors' apartments, lecture rooms, and dining

Continued on page 182



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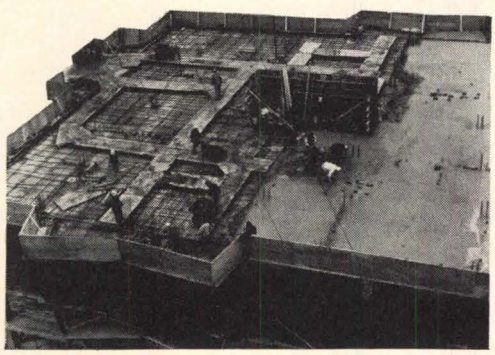

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Continued from page 172

halls. Outside and parallel to these two rows of buildings are rows of flower and vegetable gardens related to the apartments and kitchens, and, beyond these, there are two more parallel rows of dormitories. Two extraordinary planning principles are as evident here as in John Andrews' justifiably praised Scarborough College (JULY 1968 P/A): first, because many elements of campus life are woven together in a single fabric, the campus could be called a "megastructure" even though Jefferson never heard the word; second, the open-ended scheme of parallel linear rows was capable of repeated expansion as the needs of the university grew.

As it was built, of course, expansion could occur in one direction only because one end of the campus was closed with the Rotunda, which was to have served as chapel and library. The inclusion of this building, which Jefferson based on the Pantheon, was the suggestion of Benjamin Latrobe, whom Jefferson, as President, had appointed Surveyor of Public Buildings at a critical time and whose advice he requested. Lewis Mumford has called the presence of the Rotunda "the only real weakness . . . in the whole conception." The opportunity for expansion in the other direction was destroyed, together with a mountain view, when Stanford White closed the rectangle, with Cabell Hall and its flanking laboratories, in 1898. White had earlier damaged Jefferson's work by redesigning the Rotunda after it burned in 1895. As Frederick Nichols has written, "With its three great oval rooms on the main floor and its free form hall, the Rotunda had the finest suite of oval rooms in America. . . . Over the protests of the faculty, the interior was completely changed when the building was rebuilt by Stanford White."

Jefferson asked that on his tomb he be called, "Father of the University of Virginia," and father of the University he certainly was. In addition to the felicitous planning and design of the buildings, the scope of Jefferson's services to his client was immense. To begin with, the client was Jefferson's own conception: in 1796 and again in 1817 and 1818 he wrote and steered through the Virginia legislature bills establishing a hierarchy of free schools and providing for their support from state taxes. He personally chose the site for the university and supervised its construction, and, in some cases, the training of the workmen. He selected the faculty, the curriculum, the books for the library, and even typical menus for the dining halls.

Continued on page 187

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The thoroughness of Jefferson's commitment to this immense project and to the lesser ones that preceded it — a commitment which, along with his political commitments, resulted in such neglect of his personal affairs that he died a poor man — make much of our present practice of architecture, too often beginning with an unquestioned acceptance of the client's program, seem very superficial, and an evening spent with the beautiful and meticulous drawings of the Coolidge collection makes the next morning's work with door schedules and Zip-a-tone seem pallid indeed. In short, Jefferson's architectural work serves as both inspiration and admonition. That the same man was also a lawyer, a scientist, an agriculturalist, President of the American Philosophical Society, founder of the present Democratic Party, Governor of Virginia, Minister to France, Secretary of State, Vice-President, and, for two terms, President, that the same man made what was probably mankind's first proposal for legislation abolishing slavery, and that his other accomplishments include the Louisiana Purchase and authorship of the Declaration of Independence, a document still radical in many of its implications — all this makes Jefferson one of history's wonders. His architectural work was a lucid physical manifestation of his remarkable nature — aspirations toward the highest ideals combined with very practical common sense — and Fiske Kimball's book presents in turn a lucid and valuable impression of that remarkable work.

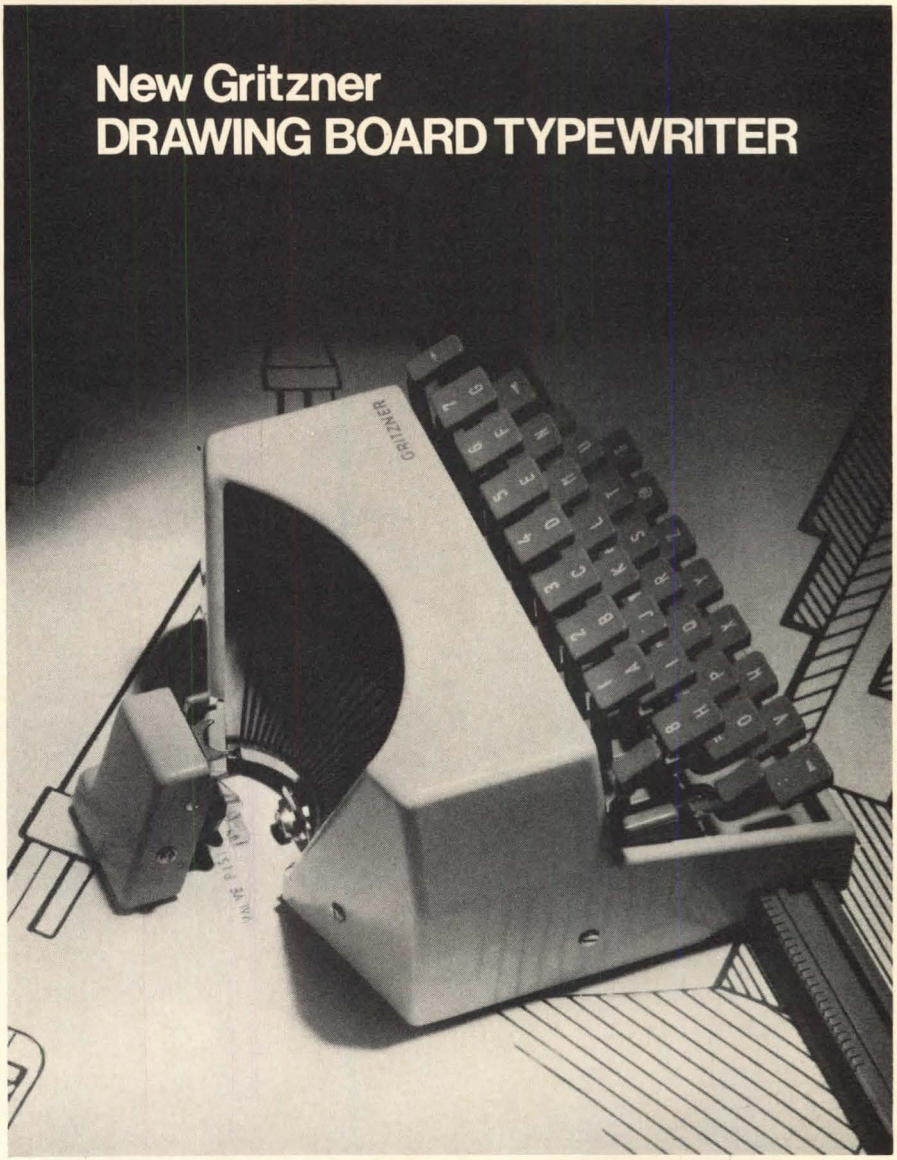
The Urgency of an Ecological Perspective

BY CHARLES A. SCHWEIGHAUSER

THE POLLUTION READER. *Compiled by Anthony Devos, Norman Pearson, P. L. Silveston, and W. R. Drynan. Harvest House, 1364 Greene Avenue, Montreal, Canada, 1968. 264 pp., $3.50 paper, $5.95 cloth. The reviewer is Chairman of the Center for Environmental Studies at Williams College, Williamstown, Mass.*

This review is being written on an east-west flight across the United States. From an altitude of 40,000 ft, the macrocosmic picture of the country unfolds at the rate of nearly 600 mph, revealing patterns of use and abuse of land, water, and air: a dam across the Missouri River, built to hold back spring flood waters because the nude soil can no longer do so; monotonous housing developments strangling themselves and their core

Continued on page 196



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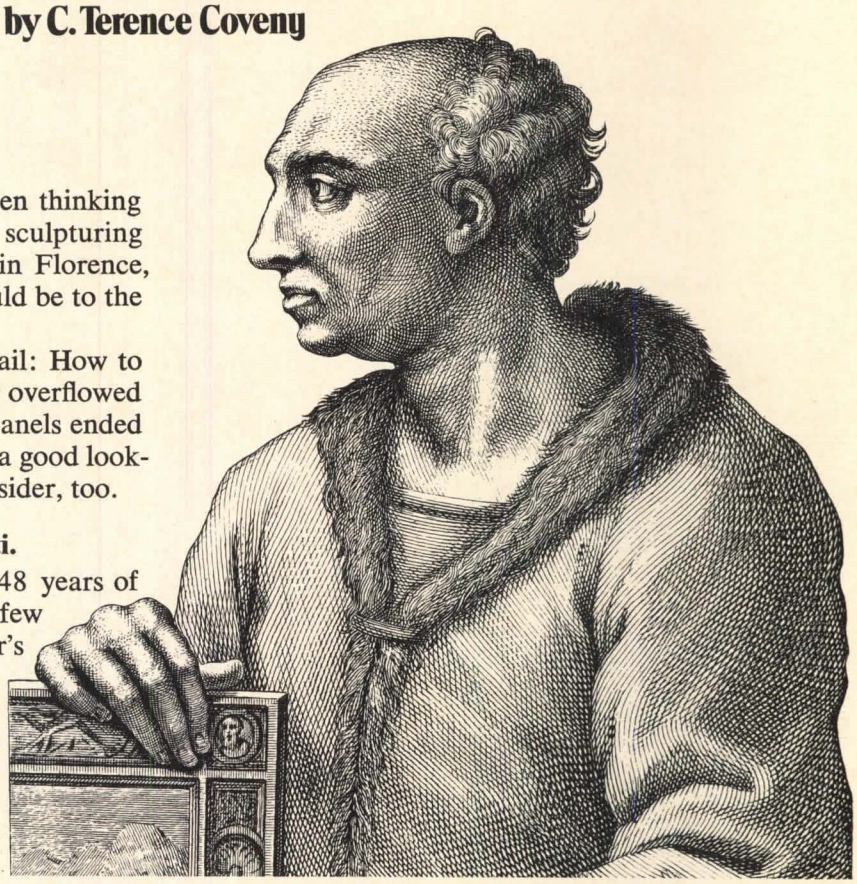
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by C. Terence Coveny



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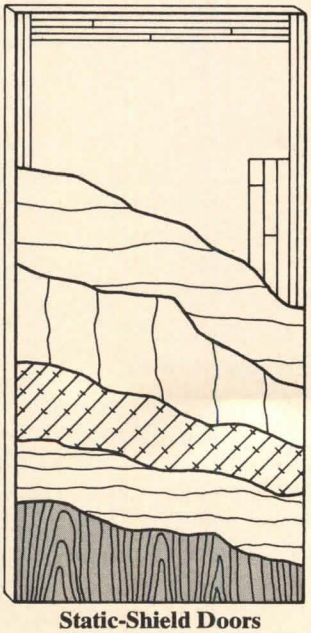
Stile and Rail Core. Exterior/...interior hardwood-faced door...closely conforms to Federal Specification LLD-D-581, Type 1, Style 11.

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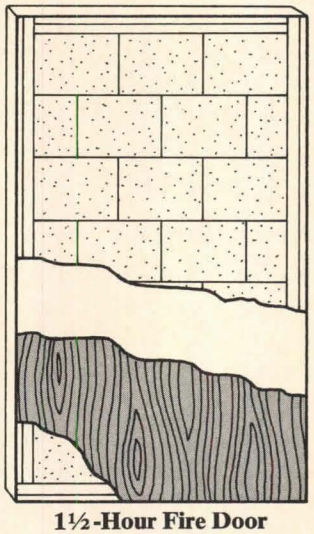
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Static-Shield Doors



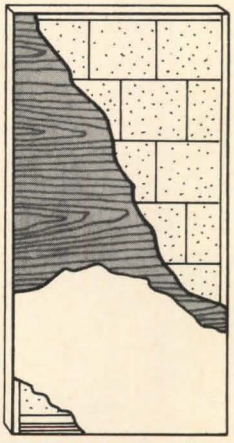
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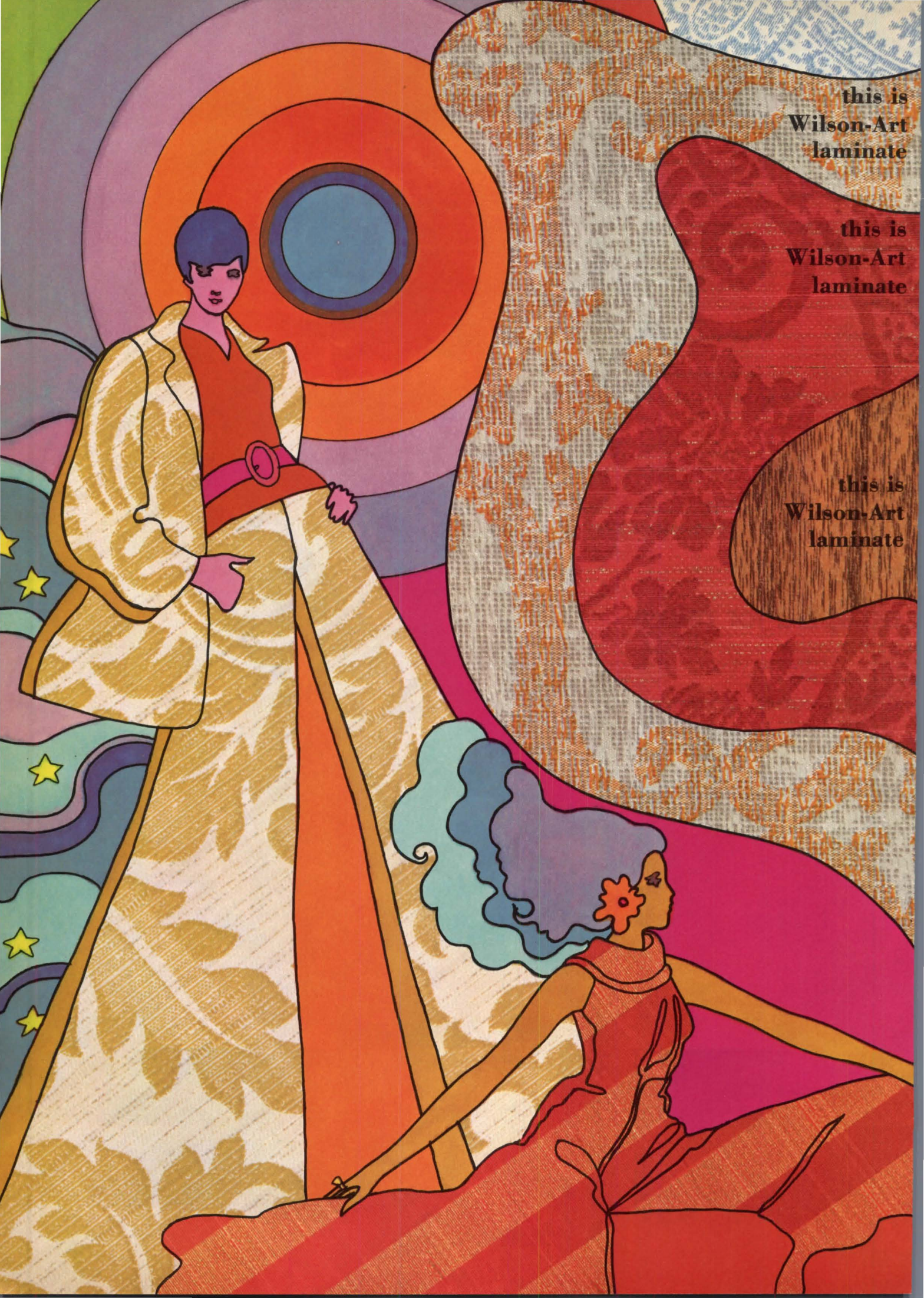
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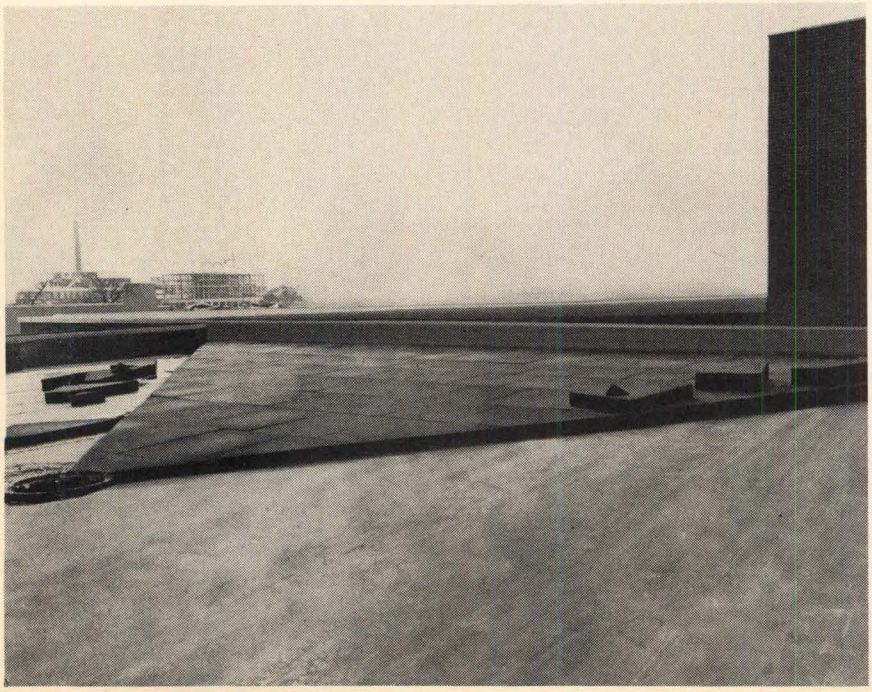
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Continued from page 187

cities; ice-free, foul water facing each lakeside city on the Great Lakes, evidence of both thermal pollution and eutrophication.

As our jet aircraft, which has been forcing into the atmosphere two tons of carbon dioxide every 10 minutes, prepares to descend on a major metropolitan area, it leaves the clear stratosphere for the septic region below. The lower atmosphere is so dense that a major lake, only a few miles from the air terminal, remains hidden under the smog. With the sun still above the horizon, the aircraft is forced to turn on its landing lights. A 45 minute wait on the runway gives the plane's "air-conditioning" system a chance to breathe in fumes from countless other jets, and passengers begin to cough as their respiratory systems try to adjust to the loathesome air. In the terminal, a drink of water, thick with chlorine and other chemicals designed to make the water potable (but not palatable), sticks in an already congested throat.

The Pollution Reader, a collection of essays based on *Background Papers* and *Proceedings* of the National Conference (1966) on "Pollution and Our Environment," sponsored by the Canadian Council of Resource Ministers, relates in detail a number of similar environmental situations, as well as many other problems that human beings have created for their environment. Current data on the various kinds of pollutants found in food, soil, water, and air are methodically arranged and discussed from several points of view: the quantity and quality of the contaminants, their sources, their influence on the medium in which they are found, their transfer mechanisms, and their effect on the many organisms in the ecosystem, including human beings. Other essays discuss the ways in which pollution can be measured and controlled. The chapters that relate the nature and effects of pollutants are good reference material for anyone who has an interest in understanding the changes taking place in the environment: pesticides, lead, coliform, nitrates — all the materials that alter an environment (and their effects so far as they are known) are listed. An excellent glossary of terms is provided for the nontechnical reader.

A good case can be made for using water as the basis of land-use and management. This book quite appropriately devotes three essays to water, outlining two Canadian case histories and suggesting a number of social, political, and economic improvements that will in turn as-

Continued on page 202

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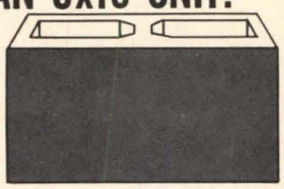
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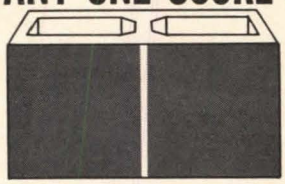
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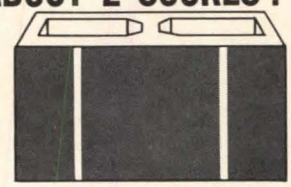
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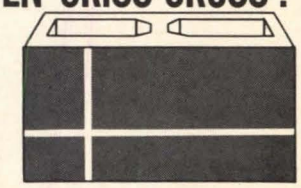
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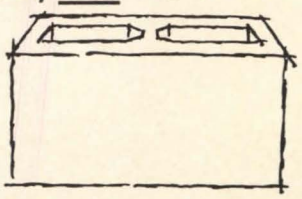
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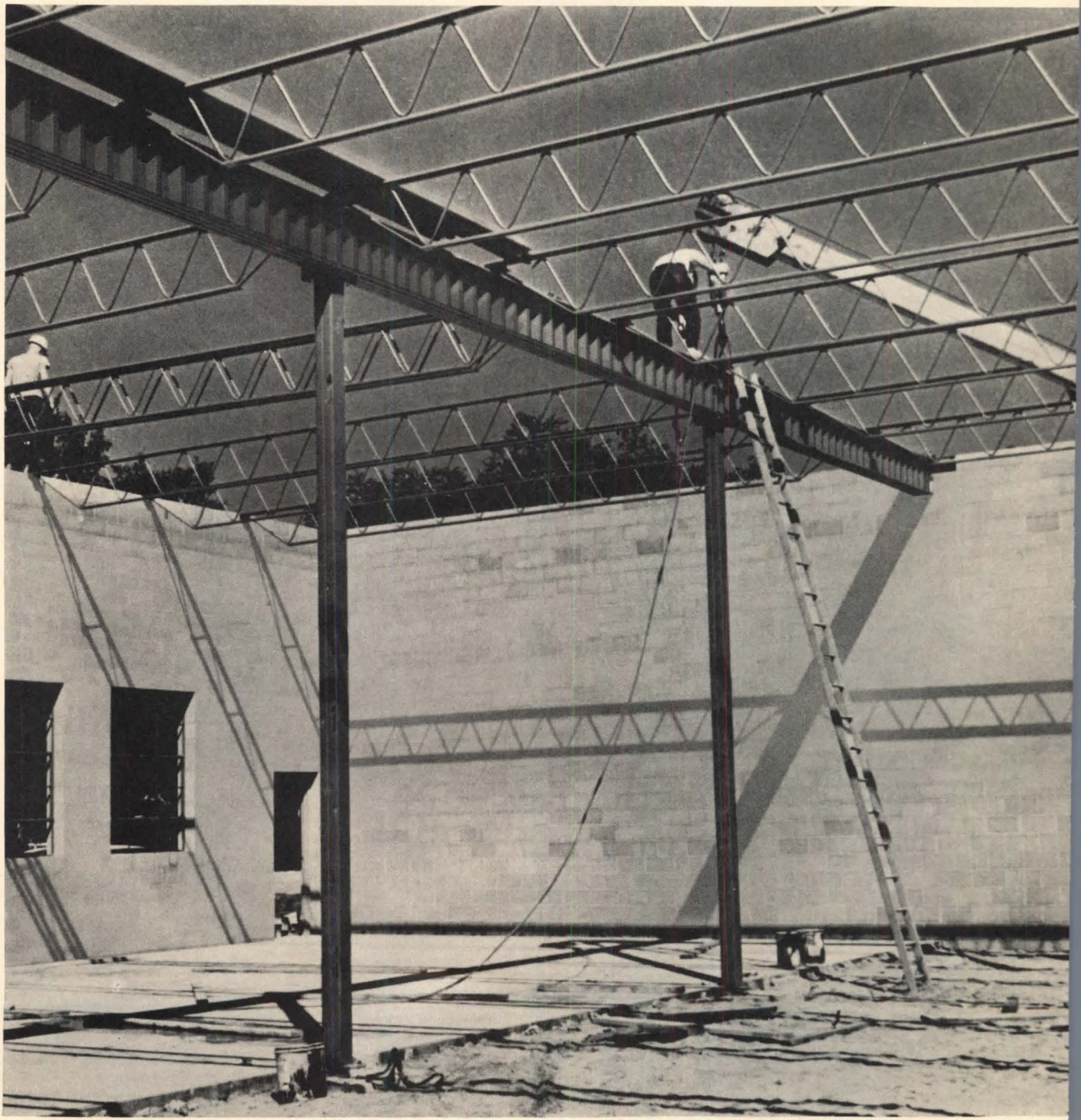
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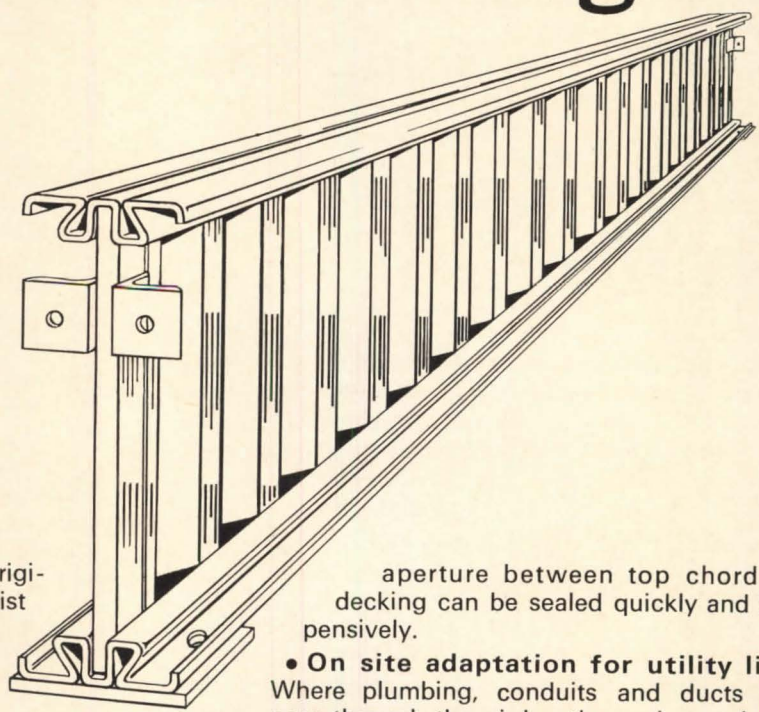
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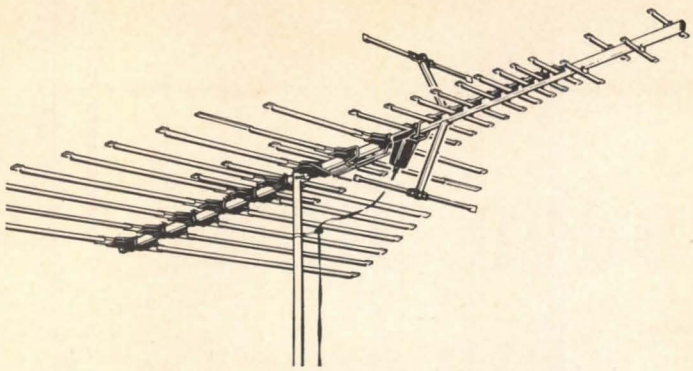
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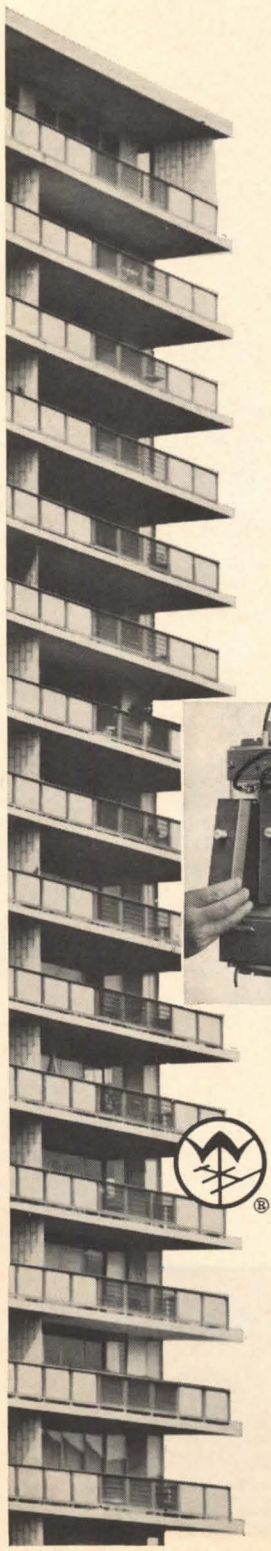
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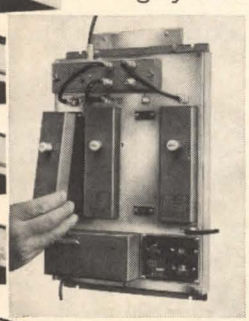




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Continued from page 196

sure intelligent and acceptable water resource uses.

Nearly every paper attempts to define pollution. The following quotations are illustrative:

"Pollution is the addition of foreign matter to the natural environment to a degree which is insupportable by nature."

"Pollution . . . may be understood to include any substance present in the water which renders such water unfit for the purpose for which it is intended."

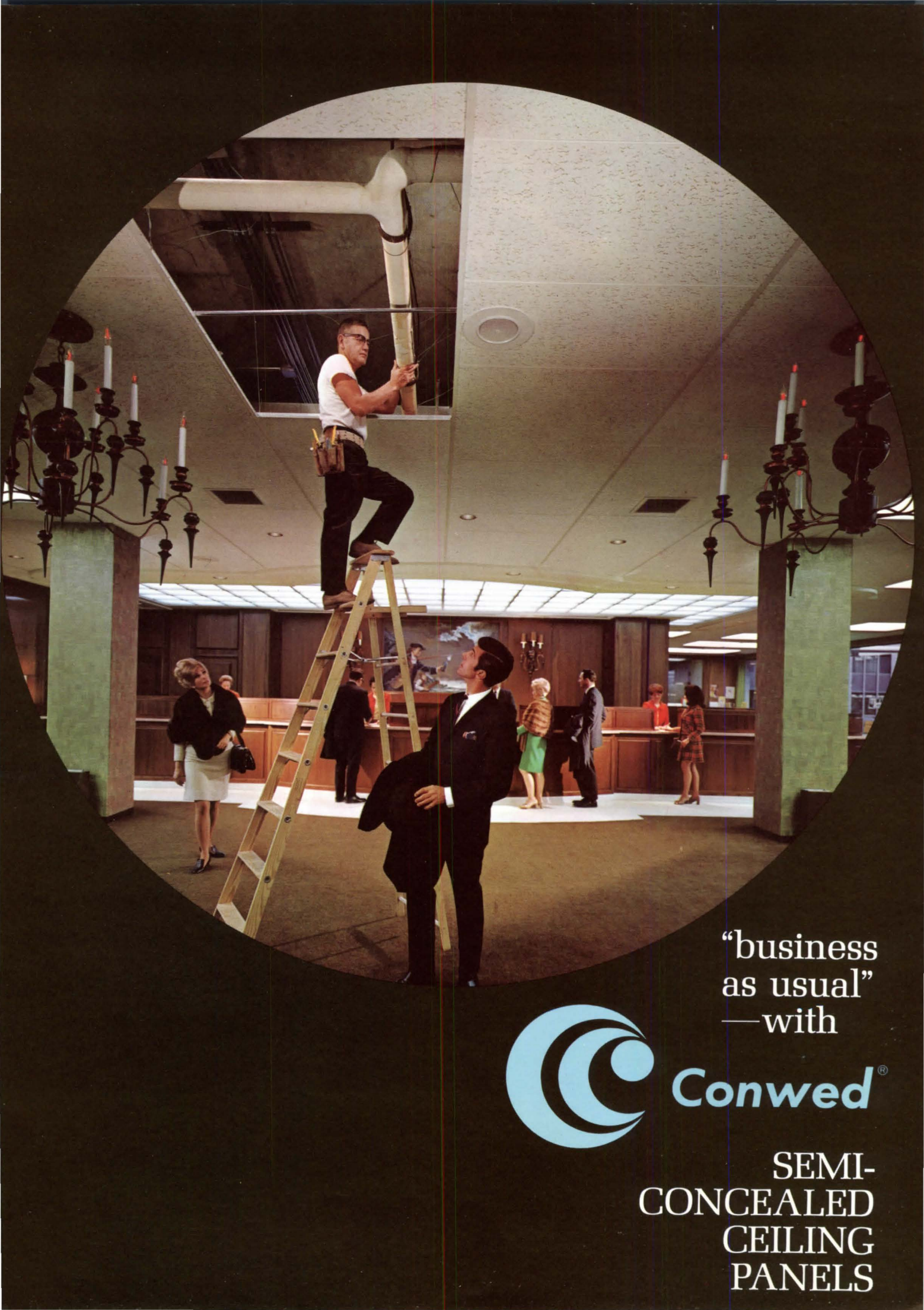
"Community air pollution may be defined as a condition of the ambient atmosphere that is due to the presence of substances, liberated by man, in concentrations sufficient to interfere directly or indirectly with his comfort, safety or health, or with the full use and enjoyment of his property."

The point to be made is that pollution is the result of materials added to an environment in sufficient quantity that they alter that environment in such a way that it can no longer function normally. If the environment ceases its customary functions, so, too, do the living beings that interrelate with it.

The approach in all these essays is scientific and objective. Cause and effect relationships are outlined in a disarming, straightforward manner. But even scientific nonchalance is submerged under a sense of urgency that runs through all the papers. Two circumstances contribute to this feeling: First, sources of contaminants at critical levels must be curtailed before localized disorders become regional disasters. Second, since there are large gaps in knowledge about the effects of contaminants, and since no beneficial contaminants, by definition, exist, pollution had better be stopped until more is known about the consequences of both the dramatic short-term effects and the consequences of the less dramatic but possibly more serious long-term effects.

Reviewers sometimes cite repetition as an inherent weakness in a collection of essays. *The Pollution Reader* is repetitive, but this condition is not due to editorial shoddiness. It is due, rather, to the reality of the continuity of the physical environment. A change in one part of the physical environment is felt throughout the whole system. The phenomena of nitrogen, for example, appear in the sections soil, water, and air pollutions because, in its various forms, nitrogen may be a pollutant that causes a number of alterations, some of them undesirable, in the

Continued on page 212



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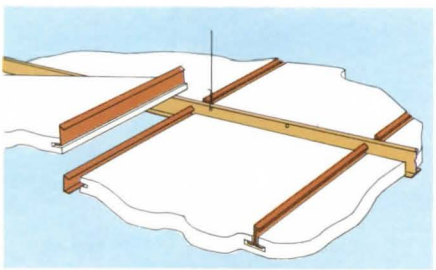
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Design beauty plus suspended ceiling accessibility and economy are achieved with Conwed's new Semi-Concealed ceiling. This unique ceiling system reduces visible grid to a few parallel main runners for linear design emphasis. If desired, even the exposed grid can be hidden by lighting fixtures. The Semi-Concealed system offers a truly beautiful and versatile designer ceiling for the architect and interior designer.

What's more, Semi-Concealed permits complete accessibility to the plenum area, so in demand for maintenance and remodeling. Result —

1. No down-time in normal business activity.
2. No costly overtime labor.
3. No long delays in "entering" the ceiling.

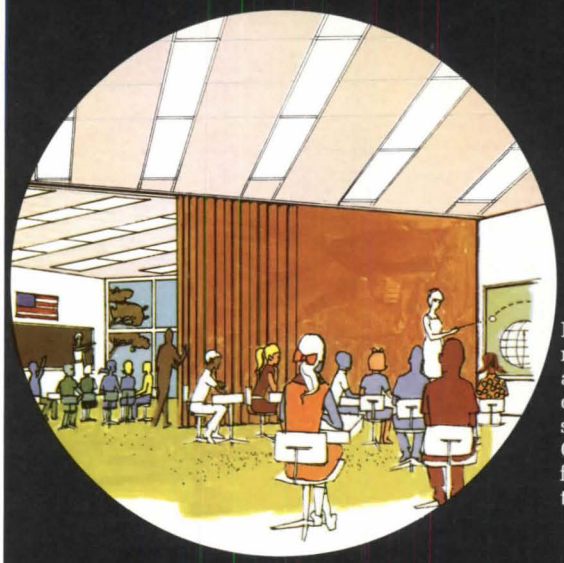


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Look into this unconventional designer ceiling from Conwed that offers all the conventional benefits. Write for complete data.

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Fewer grid lines make Semi-Concealed a beautiful, practical ceiling for open-plan school arrangements. Ceilings appear to flow from one room to another.



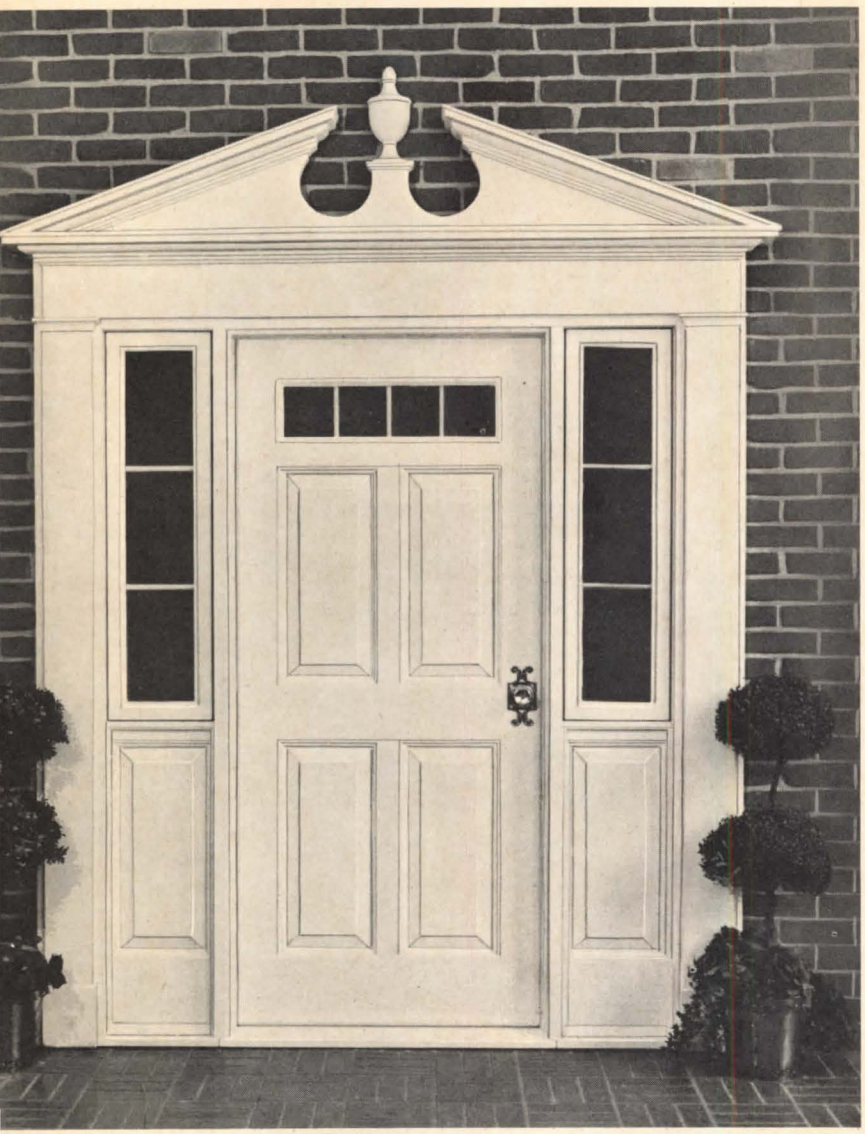
Since lines in a Semi-Concealed ceiling flow only one way, you can choose the direction to make narrow spaces appear wider and wide spaces appear narrower.



Obtain the appearance of fully concealed 12″ x 12″ tile by combining Semi-Concealed ceiling panels and recessed lighting troffers. Yet all conventional suspended ceiling accessibility and economy features are retained.

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The power of attraction .....



CARADCO Doorways

the Entrance with the Insulated Door

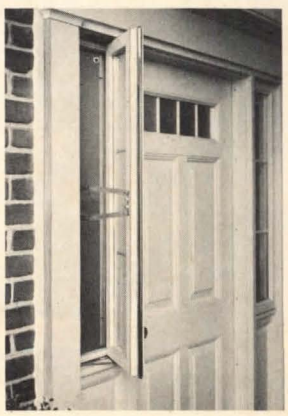
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Result? A lot of thoughtful architects put CARADCO out in front.



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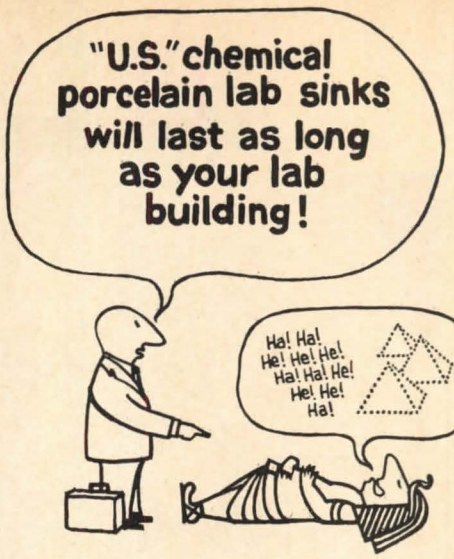
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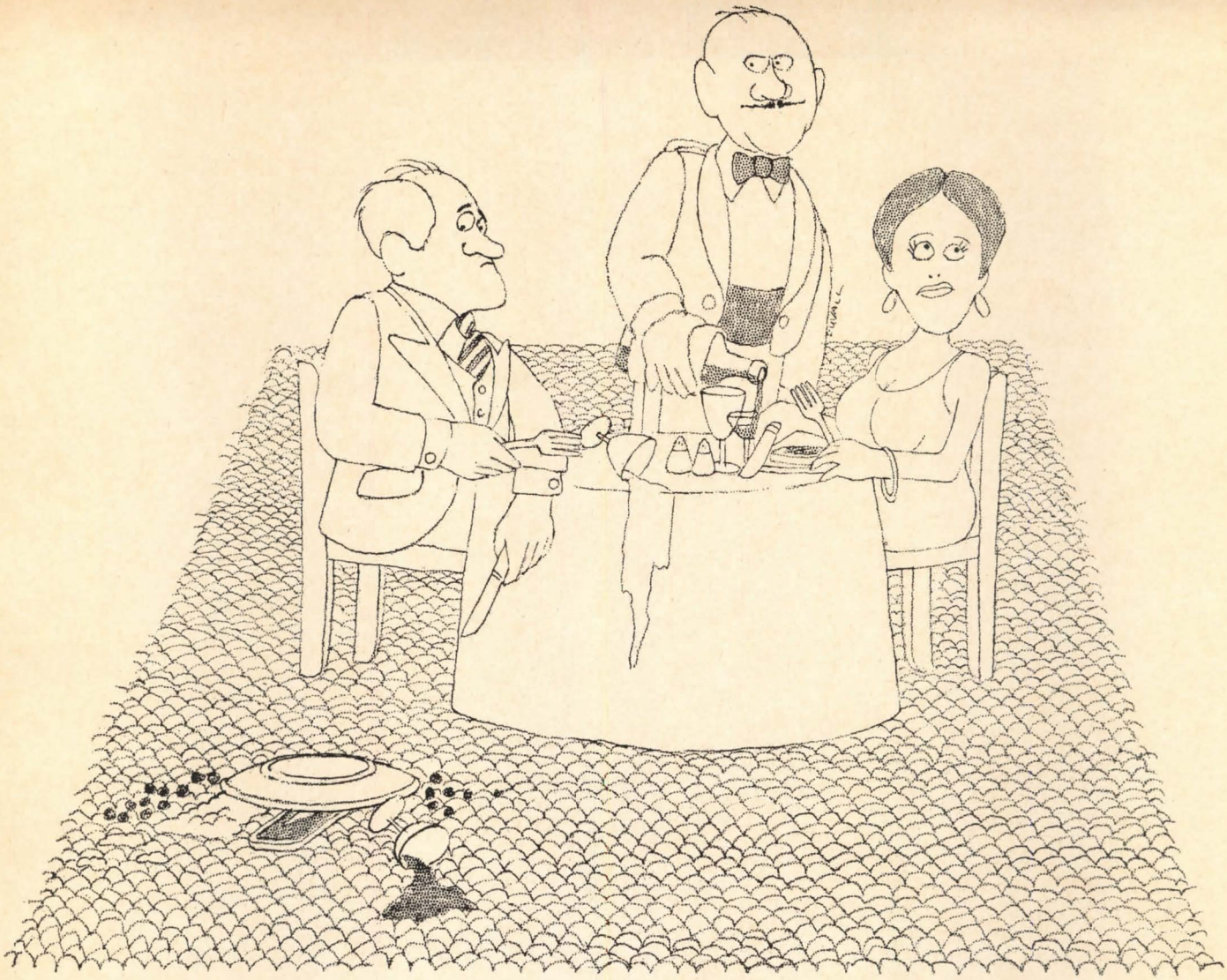
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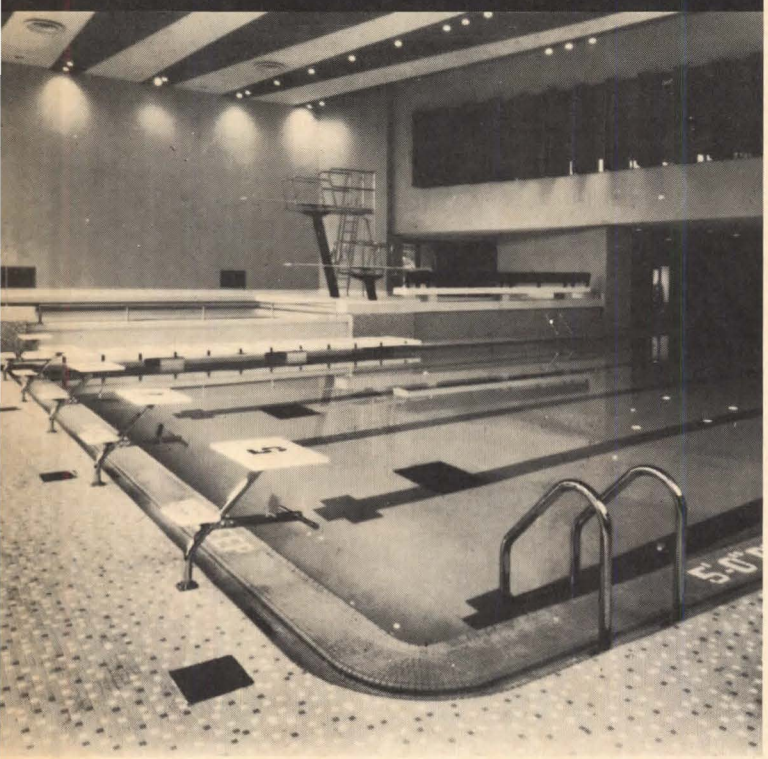
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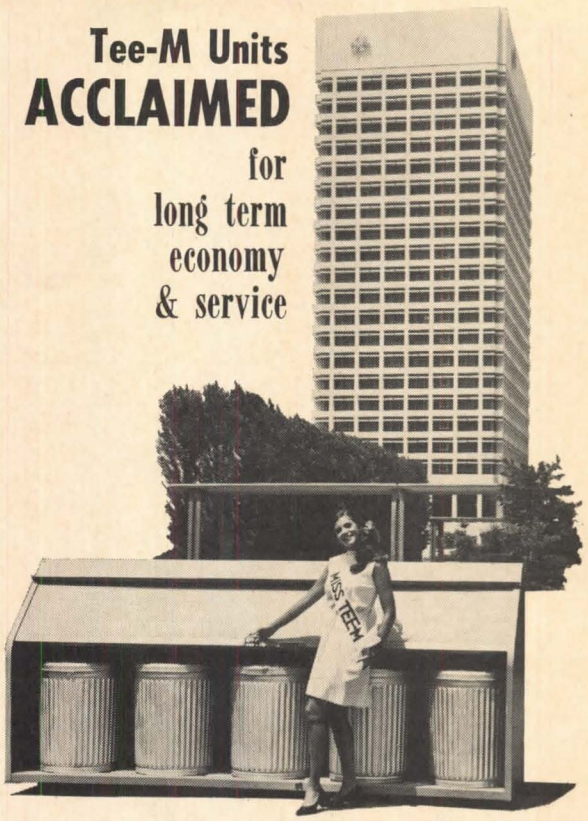
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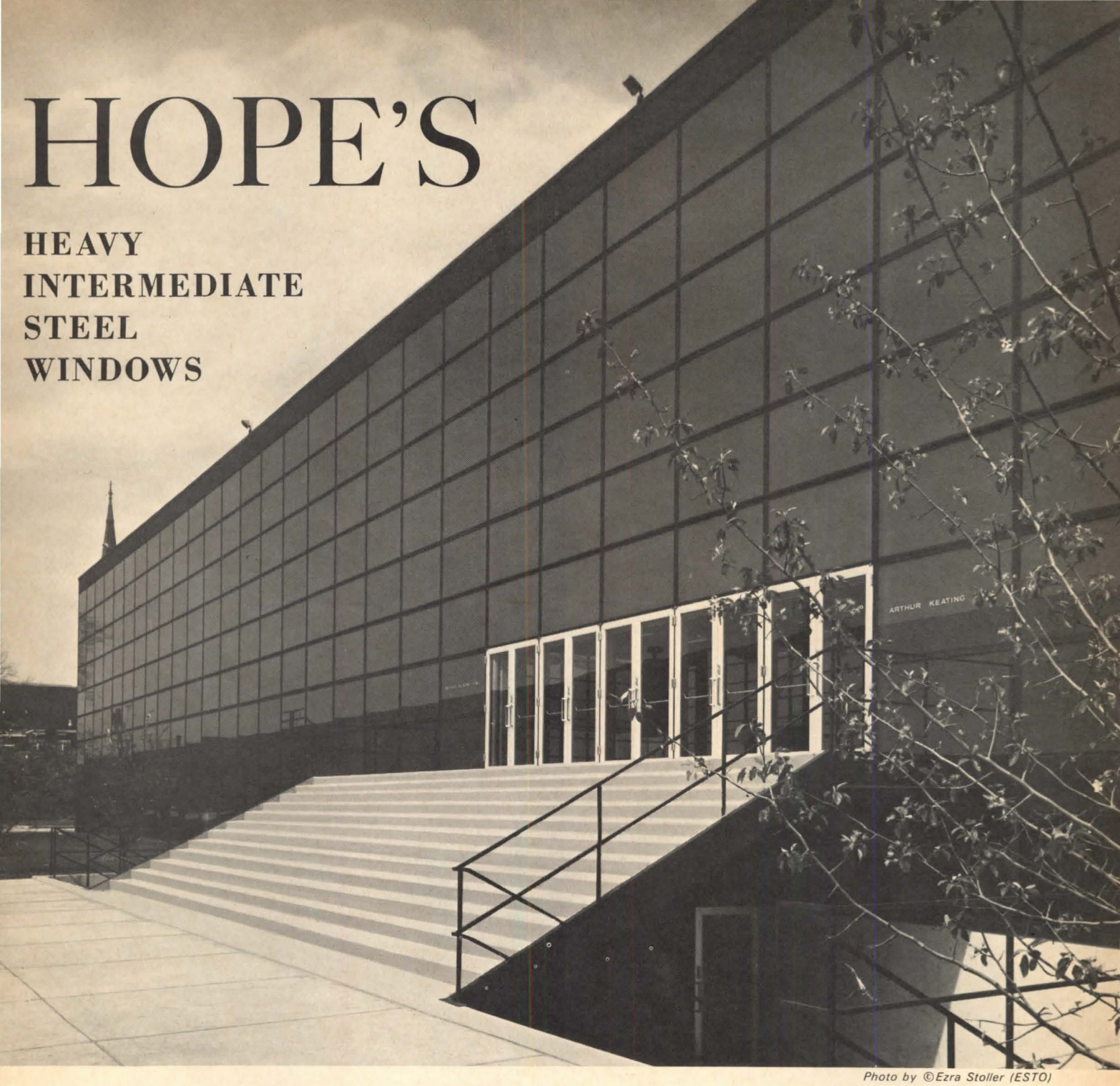


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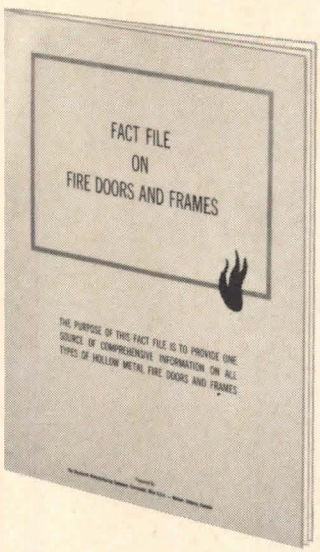
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Continued from page 202

environment. The first and most important chapter, "The Ecological Perspective," makes very clear the attitude that we must use to approach real or potential environmental problems: "Pollution is the result of actions which are taken without reference to an ecological system. An action which disrupts an ecological system results in pollution." Only when we learn how to unite the words "logical" (reasonable) and "eco" (environment) will we enjoy ecological success in a pollution-free environment.

Urban Africa

BY PETER C. W. GUTKIND

THE URBANIZED NIGERIAN. *By Theophilus Adelodun Okin, Exposition Press, Inc., 50 Jericho Turnpike, Jericho, N.Y., 1968. 72 pp., $5. The reviewer is Professor of Anthropology at McGill University, Montreal, Canada.*

"Africans," T.A. Okin writes, "cannot resist urbanization as they have resisted progressive forces from time immemorial." This is a meaty and controversial introduction, which, unfortunately, the author does not explain further. Thus, a good start becomes rather thin as one reads through this little book.

Okin is deeply concerned with people — Africans — and he concludes that "Cities are for people," because people are important. But because the physical and sociopolitical forces unleashed by extremely rapid urbanization in Africa trample on the individual, the African urbanite lives in an environment that constantly violates his traditions and destroys any prospect of the maximum utilization of man's greatest achievement: the cultural impact of urban life.

From much of what Okin writes, in his capacity as architect and planner, as an African and a Nigerian, it is not always clear whether he seeks rather nostalgically to bring the past into the future. He sees in the traditional patterns of African ecological arrangements, of community, of social arrangements and mutual reciprocity, a potential to be harnessed by those concerned with African urban growth. Nor is it always clear whether he sees this approach as the antidote to the enormous complexity of rapid change in an environment new to most Africans. The propositions in these arguments are not very well documented, perhaps because it is impossible to adapt the past to the present, except in the realm of an ideology that seeks to show that there

Continued on page 218

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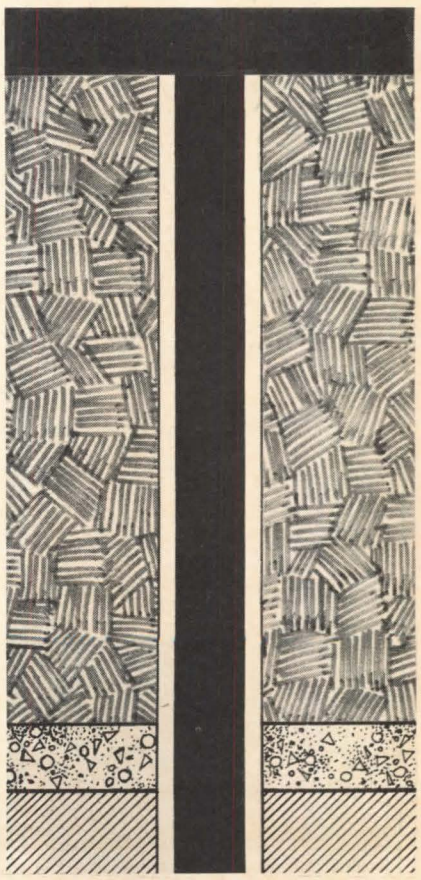
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Architect: Houstoun, Albury, Baldwin & H. Maxwell Parish, Miami
Interior Design: Houstoun & Parish, Miami
Consulting Design Architect: Leo A. Daly Co., Omaha
Consulting Engineer: Breiterman, Jurado & Associates, Miami

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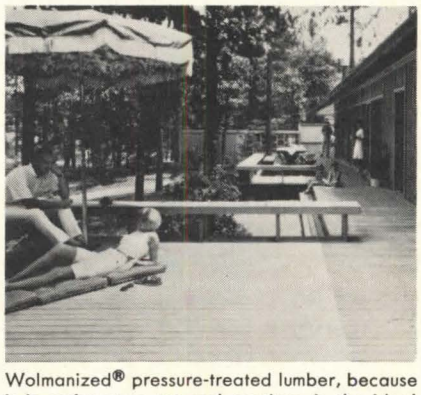
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KOPPERS

Architectural and Construction Materials

Continued from page 212

was a past and a very rich cultural heritage, which is vital for us to understand, and which brought man and nature into an ecological and social symbiosis.

The most hopeful signs in Africa are the chaos, the instability, the personal dilemmas and uneasiness, the complexities of adjustment *and* the growing social distance between the few rich and the vast masses who are poor, rejected and dejected, whose prospect of a better future are clouded in uncertainty. For the vast majority of Africans, economic and social demands cannot be met, not to speak of towns and cities as communities rather than as dehumanizing replicas of 19th Century Western slums, so that the African urbanite is "trapped" in a "never-ending struggle" to seek, hopelessly, alternative ways of making a living. But these are circumstances that contain the seeds of true modernization, simply because the modernization of man and his environment can only be achieved with the thrust of a vast intellectual and political explosion that lays to rest stagnant premises. Although Okin is a planner, he treats some of these premises, but he does so in an exceedingly superficial manner. The thrust of his ideas stems from second-gear thinking.

It is true that Okin indicates how the settlement patterns of African societies impede the introduction of new planning ideas. Yet it is never clear whether Okin considers the structure and function of the African "Organic Courtyard" the kind of spatial arrangement that can be updated. Although the author deplores long-range schemes that do no more than to give some second-rate engineer an opportunity to put on paper what he considers good for people, his suggestions for short-range projects are little more than patching up.

Physical planning does not rest merely on some nice motherhood premises about "people," but, far more significantly, if we ever want to get to first base, on a major political transformation — not only internally, within the African countries, but also externally, in the rest of the world. The slum areas of the low-income world are the most visible evidence of the brutal exploitation by local élites and the rich Western world. This is as true about Lagos as it is about Harlem. That, and that alone, is the real dilemma of the urban African, as it is of the Blacks in Watts or the West Side of Manhattan. Perhaps Okin did not think that this was his problem to discuss — but it was. Yet Okin is presently an Urban Design Consultant to the City of New York Housing and Redevelopment Board. It is surely in that kind of environment that he should learn what the premises are which might — just might — lay the foundations for a more rewarding urban life for the city dweller.

Of course, we must be grateful to Okin for being perhaps the first African architect to turn our thoughts in the right direction — away from the engineer-planner, and toward the planner-humanist. Let him now do some hard thinking. Okin has told us, quite correctly, that our urban environment brutalizes us and that we are not moving forward. The potential of his ideas provide him with the next chapters of a new book.

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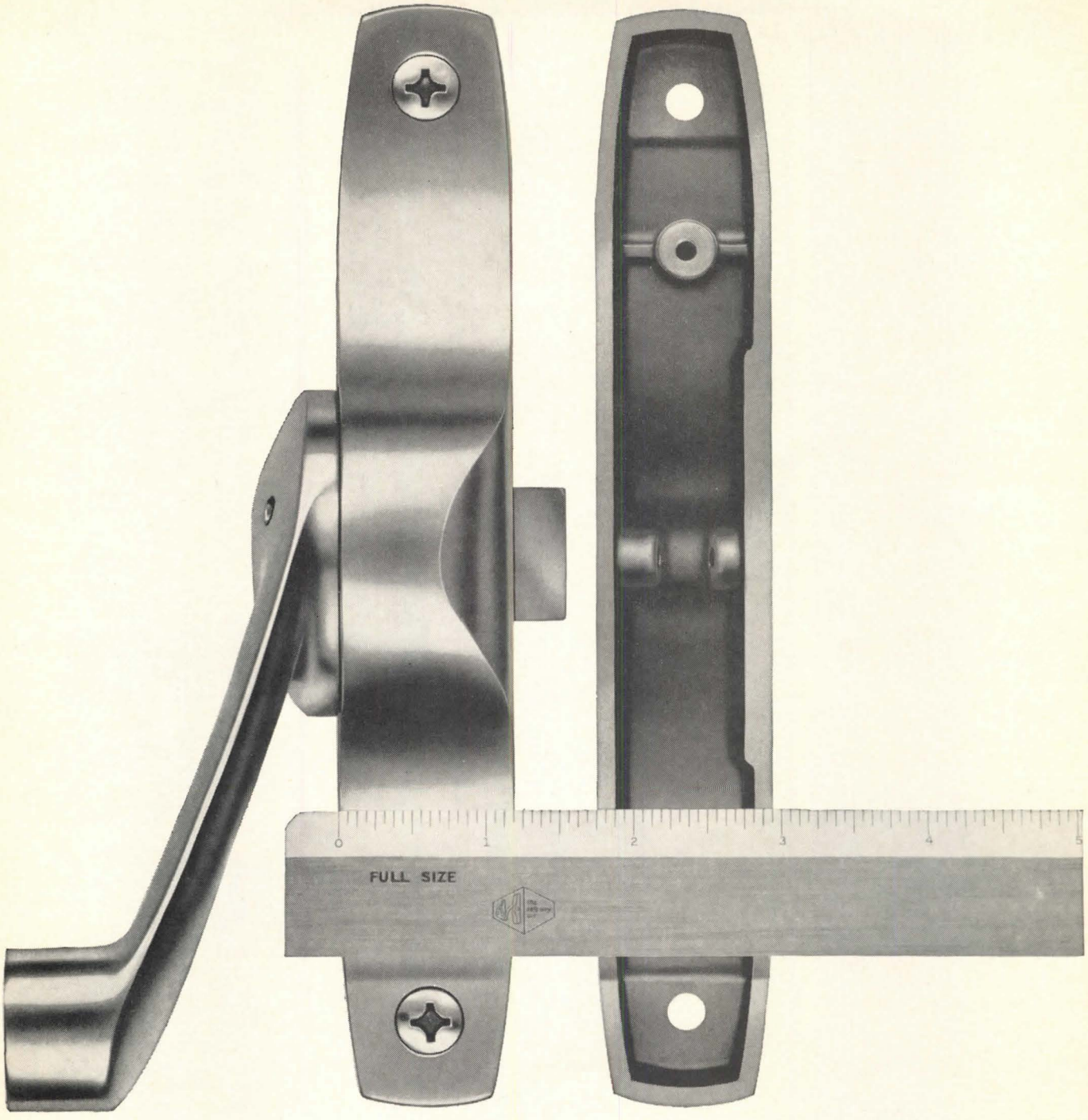
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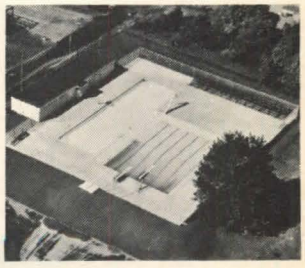
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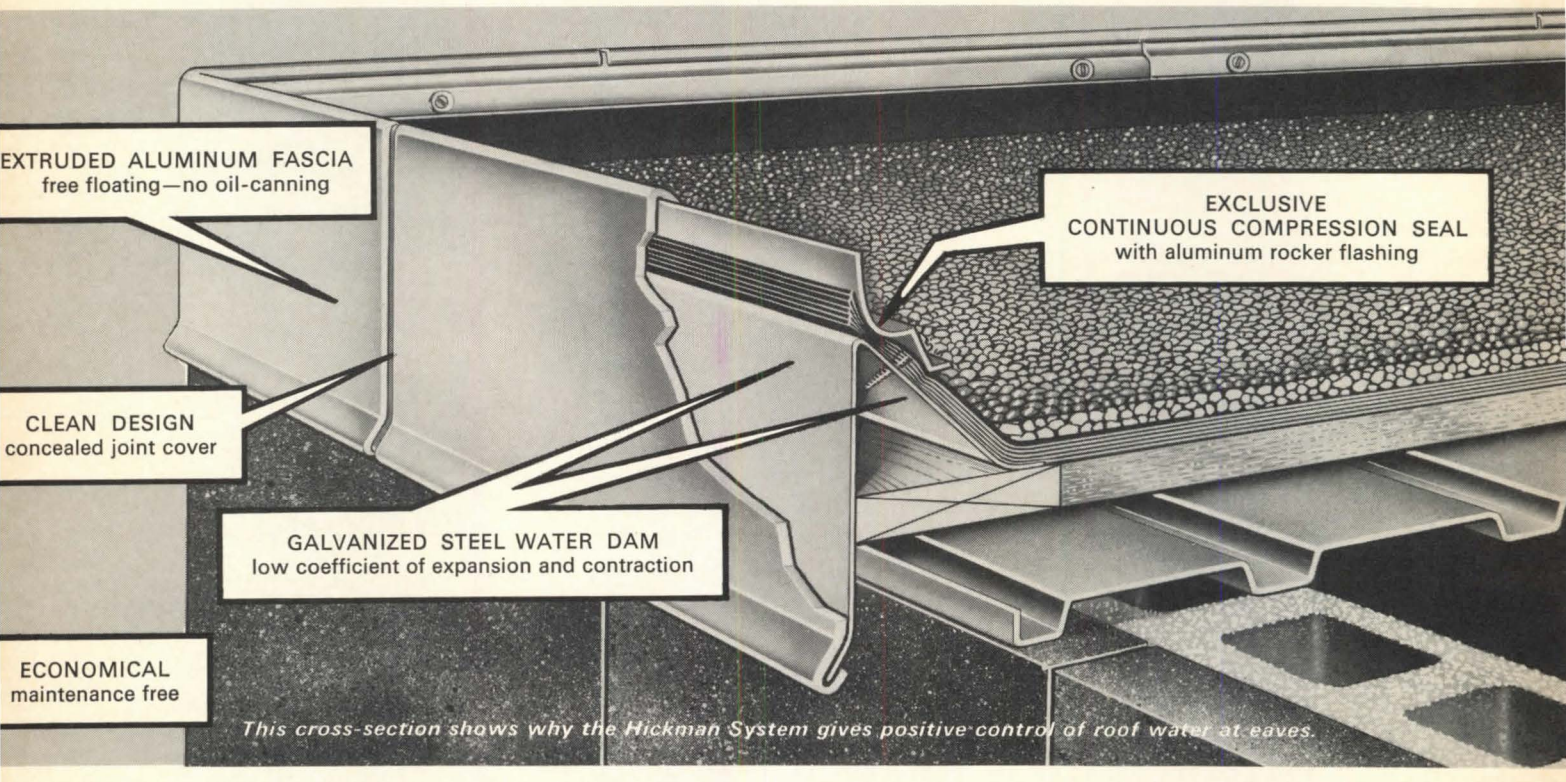
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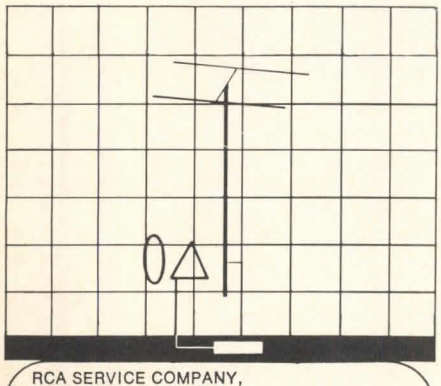
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Continued from page 218

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LEROY CALLENDER, Consulting Engineer, 101 Park Ave., New York, N.Y. 10017.

New Addresses

WELTON BECKET & ASSOCIATES, Architects-Engineers, 110 E. 59th St., New York, N.Y.

ROBERT P. GERSIN ASSOCIATES INC., Industrial Design, 11 E. 22nd St., New York, N.Y. 10010.

ROGER K. LEWIS, Architect and Planner, Suite 430 Georgetown Bldg., 2233 Wisconsin Ave., N.W., Washington, D.C. 20007.

SAMUEL PAUL & SEYMOUR JARMUL, Architects, 3000 Marcus Ave., Lake Success, L.I., N.Y. 11040.

IRVING L. PEABODY, ENGINEERS, INC., Engineers-Surveyors, Land Planners, 8401 Monroe Rd., Houston, Tex. 77017.

Name Changes

KILHAM BEDER & CHU, Architects, 101 Park Ave., New York, N.Y. 10017; formerly O'CONNER & KILHAM.

LITTLE, LAIR & PILKINGTON, Architects, 2180 Brickell Ave., Miami, Fla.; formerly, ROBERT M. LITTLE & ASSOCIATES.

WARE, LEWIS PARTNERSHIP, Architects, Engineers, Planners, 414 South State St., Jackson, Miss.; formerly, OVERSTREET, WARE, WARE & LEWIS, upon the retirement of Noah Webster Overstreet, Sr.

New Partners, Associates

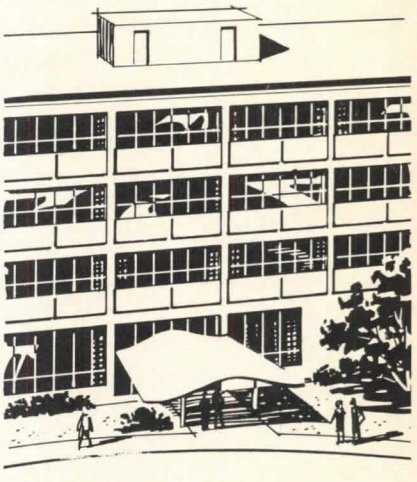
FRED BASSETTI, & Co., Architects, Seattle, Wash., have named DONALD A. FROTHINGHAM, AIA, and PHILIP C. NORTON new partners. New associates are DONALD E. BREINER, JAMES F. HAMILTON, HOWARD S. PETERSON and KARLIS REKEVICS.

FRANK GRAD & SONS, Architects, Engineers, Planners, Newark, N.J., have appointed STANLEY C. BROGREN, R.A., and HOWARD H. HORII, AIA, senior associates. New associates are: VINCENT F. BALOGH, R.A., HERBERT E. BOECKEL, JR., R.A., GEORGE L. CEDENO, R.A., THOMAS REMICK, R.A., MICHAEL J. SAVOIA, AIA, EUGENE A. SCHREIBER, R.A., and RONALD H. SCHMIDT, AIA.

ARTHUR L. SPAET, CONSULTING ENGINEER, New York, N.Y., has appointed ALAN KAPLAN an associate.

CORRECTION:
In the article on the Worldway Postal Center at Los Angeles International Airport (pp. 146-147, MARCH 1969 P/A), Cesar Pelli should have been credited as Director of Design.

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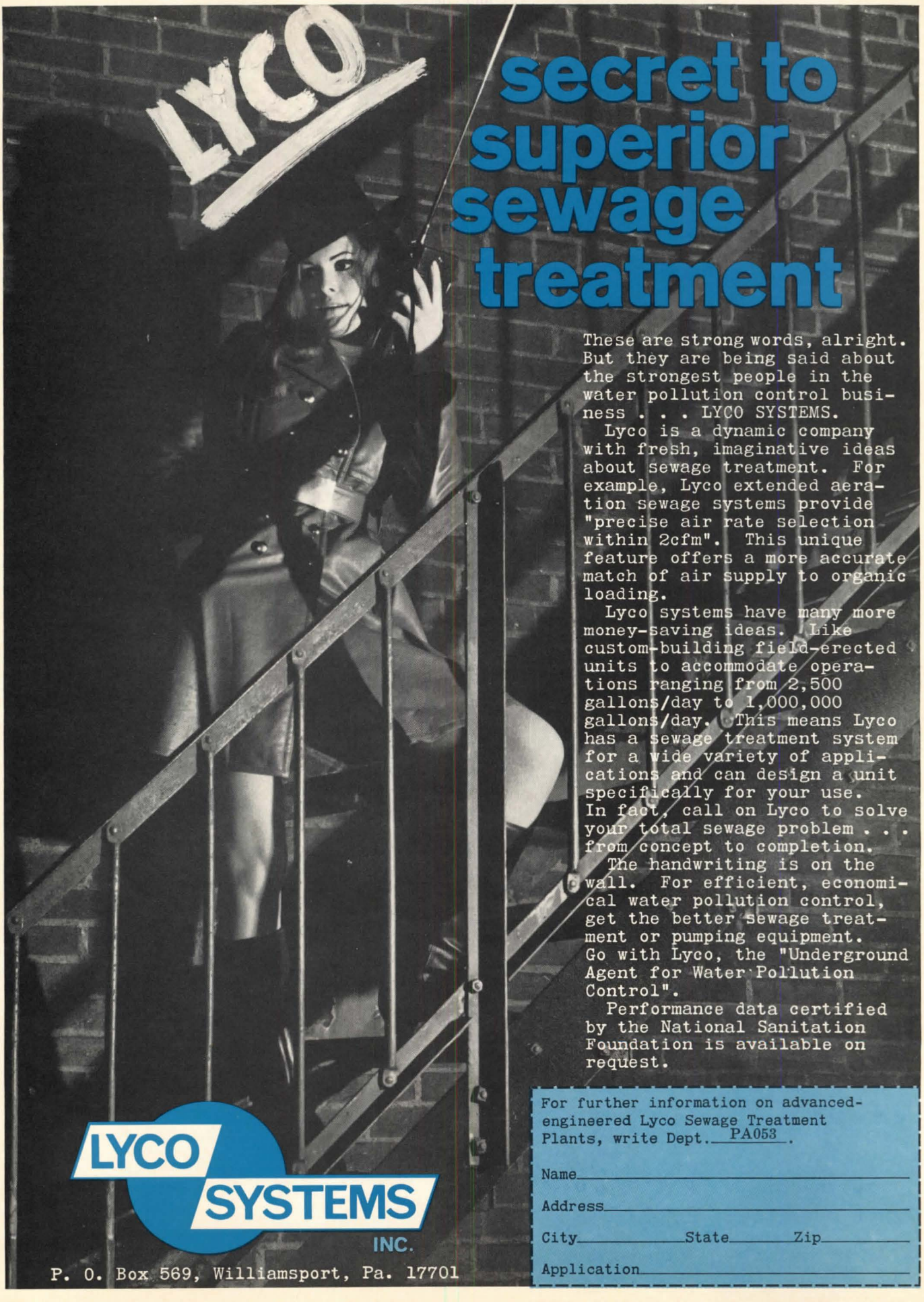
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JOBS AND MEN

Continued from page 224

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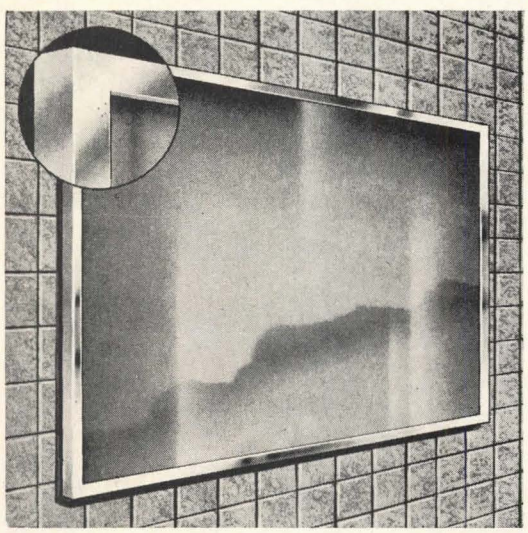
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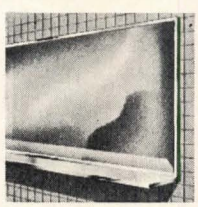
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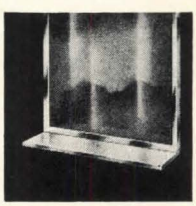
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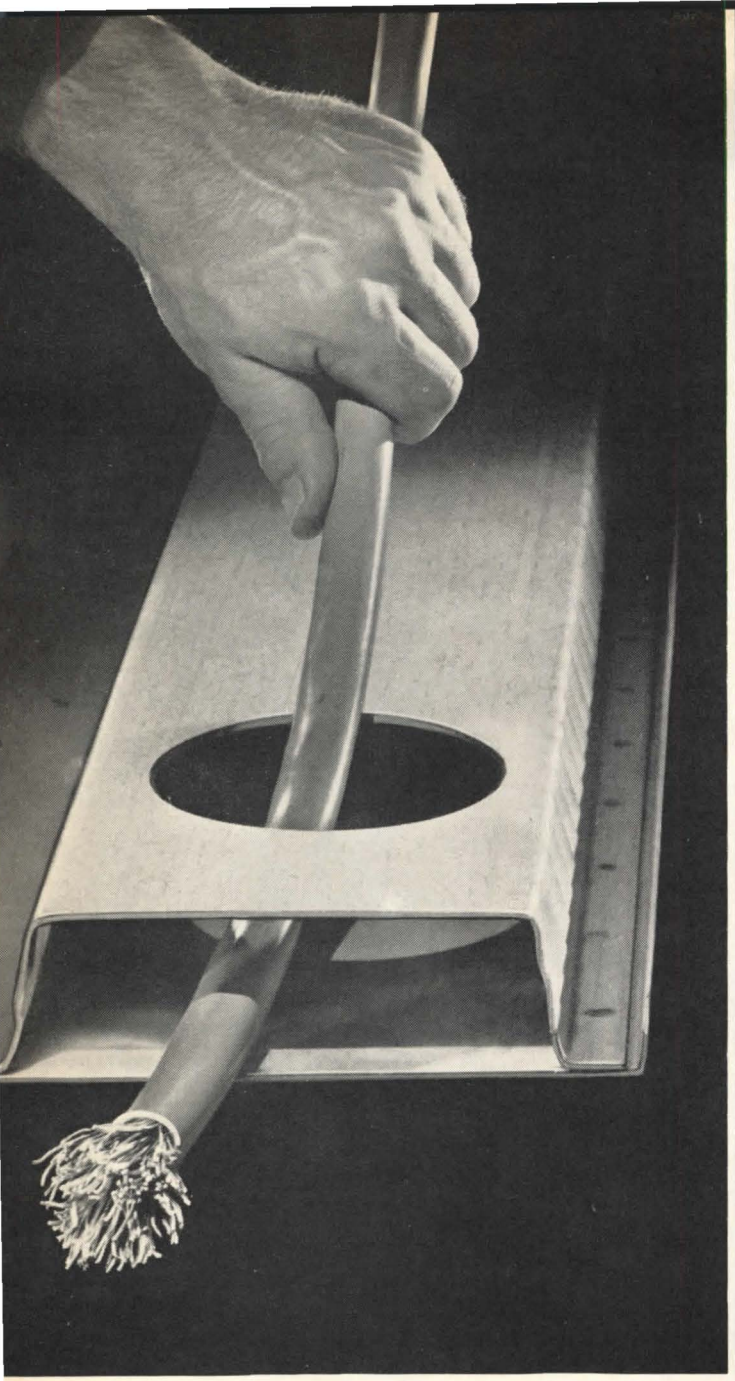
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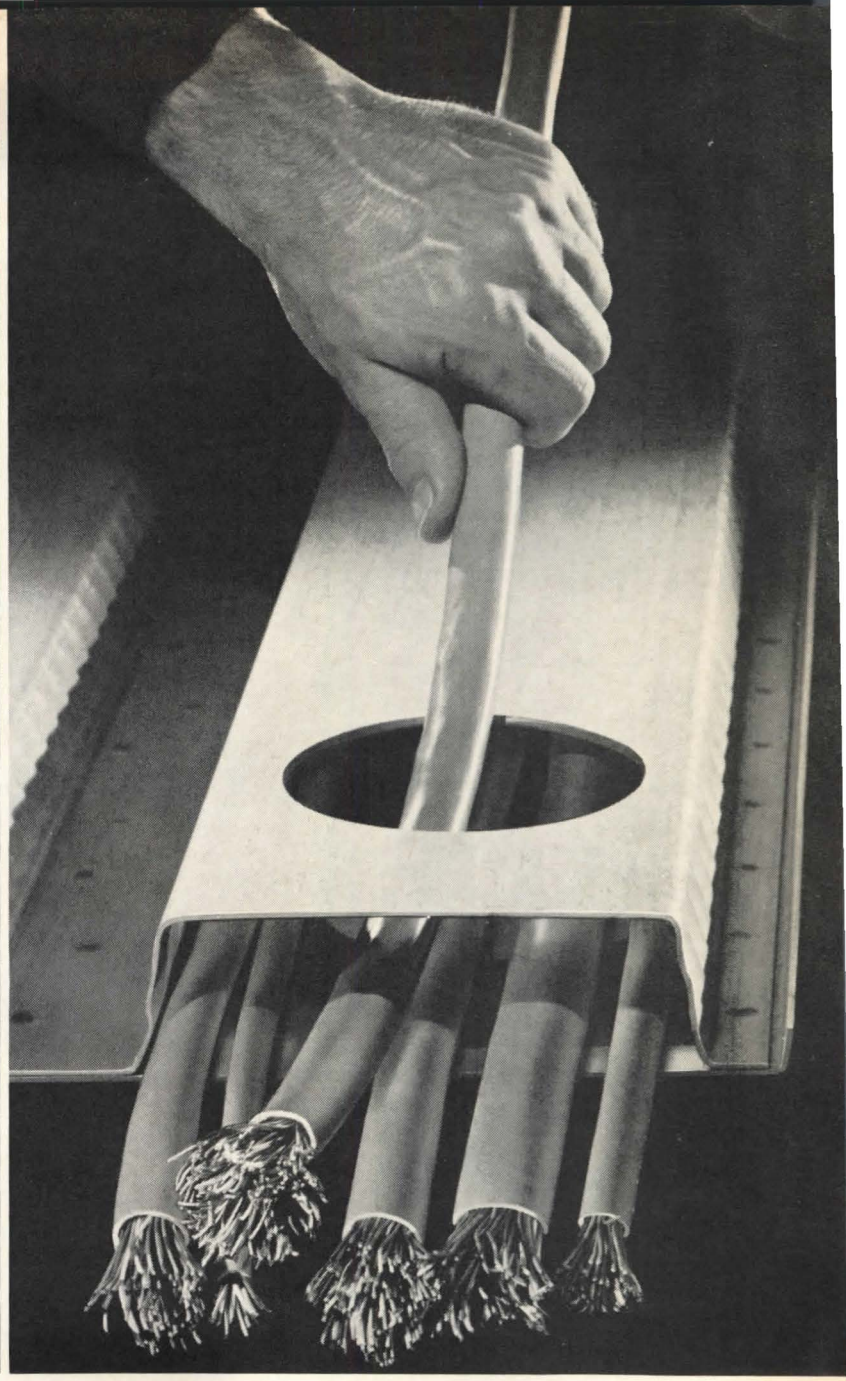
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JOBS AND MEN

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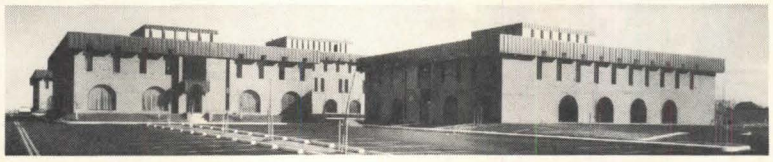
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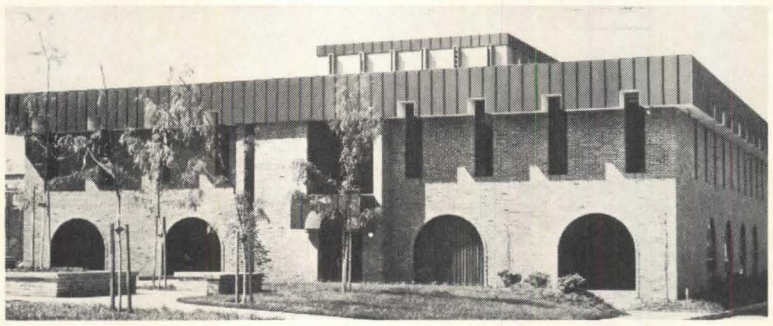
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